

Roberto Ratzke
91-92 Book III

Week 7/ Sub site

670
929

Open Scrub Gardens

Sunny Warm

CTH h	0.3	16L	
" h	0.6	18R	
CT S ad	0.2	2R	0/1
BB h	0.5	5R	
" h	0.9	8R	
Mong ad	1.7	7L	2/3
2/3 h	2.9	13R	
2/3 h	3.1	2L	buried stray
2/3 h		6L	
Chat		10L	
Ph B Seed ch	5.1		4/5
Reddy Gake		3L	
2/3	3.2	16L	4/5
T B Seed ch	4.1	6L	1/3
1/3 h	4.3	20R	
2/3 h	4.3	8L	8/7
BB h	4.2	15R	
1/3 h	4.6	20L	
1/3 h	4.5	20R	
T B Seed ch	5.1	18L	3/3
Scrub ch	5.4	18L	4/4
2/3 h			heavily damaged
1/3 h	6.3	11L	1/3.5
1/3 h	6.1	8L	
1/3 h			
1/3 h	6.2	12	
1/3 h		1R	
1/3 h	6.8		
1/3 h	6.8	19L	
1/3 h	7.8	10L	1/3.5
2/3 h	8.9	0.0	5/5
1/3 h	7.8	20L	3/5
1/3 h			
2/3 h	8.2	20L	3/6
1/3 h	8.3	16L	6/8
1/3 h	7.9	19L	4/6
1/3 h		13R	
1/3 h	8.2	17L	
1/3 h	8.9	12L	

2-1 BFL h	6.5	16R	
BB Grshb ♀	6.5	8R	7/14
Song Spar Flyh	6.3	6R	8/1
OB Siphon h	6.5	18R	8/30
W. bill w. d. h	6.7	10L	
L. Greenlet h	11	"	
A. Mourner	6.8	5L	7/13
BB Grshb sp	6.9	17L	8/17
B/T Fly h	6.7	15L	13/17
Green Shrike Vireo	7.6	6R	25/32
WBR h	8.3	17R	
L. Nemat h	8.3	2R	
B/T Sh Tam h	8.1	12R	10/22
E. R. Fly Flut h	8.6	10R	9/25
2 W B Toucan h	8.4	17L	28/33
Sage Wren Cuckoo h	9.2	18L	
SR Fly h	9.2	5L	9/28
W. Fly h	9.3	10L	
W. Fly h	9.5	8R	
" h	9.4	15R	
LB Grshb h	9.4	13L	
B. Fly Grshb h	9.5	3R	11/20
D. W. Ant h	9.8	10L	
W. Fly h	10.2	18L	
CSWA h	10.2	12R	Emp
DB W. Fly h	10.5	14R	
W. Fly h	10.6	5L	Spec

Y. Fly h	10.6	7R	25/27
4-12 Fly h	10.7	12L	
2-3-1 Fly h	10.7	15L	
T. Fly h	10.8	13L	
H. Fly h	10.7	17R	20/25
C. Fly h	11.1	8L	
L. Fly h			
Plum Fly h	11.4	10R	9/25
S. Fly h	11.5	20L	14/25
2 Fly h	12.4	6L	
SR C. Fly h	12.3	16R	
1 Fly h	12.2	7L	20/29
B. Fly h	12.8	9R	
SR Fly h	13.5	5L	6/23
B. Fly h	13.6	3L	20/25
L. Fly h	13.5	15L	
1 Fly h	14.7	17L	
2 Fly h	11	8L	
B. Fly h	14.6	15R	
Green Fly h	14.5	12R	
W. Fly h	14.6	1L	
L. Fly h	14.5	2R	
C. Fly h	14.1	7L	28/29
2 Fly h	15.2	11L	
1 Fly h			
C. Fly h	15.8	10R	
2 Fly h	16.1	15R	
1 Fly h	16.5	12R	30/35
1 Fly h	17.2	6L	
1 Fly h	18.3	10R	
1 Fly h	18.6	5L	
1 Fly h	18.6	14R	
1 Fly h	"	6L	
1 Fly h	19.2	17R	3/15

17 left

4/12/01	Spider	8 wh	1 lb
4/14/01	Orchard	5 Lr	1 lb
3/12/11	Spider	5 yf	"
4/12/11	"	9 gr	"
5/22/1	Thrip	7 Lr	1 lb
5/4/01	Spider	2 wh	1 lb
6/22/11	Lepidoptera	5 br	sandwich
7/23/1	Coleop	6 gr	1 lb
3/30/11	"	7 Lr	"
4/15/11	Spider	2 H/L	1 lb
6/18/11	"	10 gr	"
5/17/1	Harpy	3 wh	1 lb
4/13/1	Coleopt	6 gr	1 lb
2/26/1	Spider	2 gr	"
5/22/11	"	5 Lr	"
	Orchard	40 gr	2 lb
	Roach	10 Lr	1 lb
	Spider	3 wh	1 lb
	Katydid	3 yf	"
	Spider	9 yf	"

23m

cloudy, rain

ACTUAL 12 MARCH

620-940

Dusky Robin h	0.1	5L	
2 BT Salt h	0.2	4R	
2 Small Rump Tan h	"	4R	
W. Saur h	0.2	11L	
RB Spine Tail h	0.4	3R	
2 BC Woodpeck h	0.9	15L	
LB Broadwing h	0.8	6R	
Cl. and Red Flyc h	0.8	7R	
B. Antshrike h	0.5	7R	
2 BT Salt h	1.2	8R	5/12
VT Euphonia	1.1	13L	
Kentucky h	0.9	10L	
210 B. W. Warbler h	1.4	14L	25/28
2 Mealy Parrot h	1.1	4L	28/28
Wedge-billed Woodpeck h	1.3	12L	
YT Oriole h	0.7	18L	
Green Antshrike h	1.5	13L	
2 YB Cuckoo	1.7	11L	
Common Coll. Tan	1.7	6R	
CSWA S. Vireo	1.8	20L	9/13
BTWN S. Phoebe	"	"	
W. B. Wren h	1.9	9L	
G. Antshrike h	2.1	1L	ab. lower
L. Hermit S	2.6	0.0	
W. Saur h	2.7	13R	
L. T. Hermit S	2.7	00	
Swampy br Woodpeck	2.7	5R	9/21
2 BT Saltwater h	3.1	18R	
Tanager h	3.2	17L	
W. Saur h	3.2	5L	
W. Saur h	3.4	15L	
Redstart (ad)	4.2	2R	14/15
Hummer (pink)	"	0.0	
Sp. br Wren h	4.2	5R	
WT Sub. Wren h	4.6	16R	10/25
Sp. br Wren h	5.2	9L	
AT Hummingbird h	5.2	5R	
W. Saur h	5.3	6L	
W. Saur h	6.2	4L	

E

LB Gnatcatcher h	6.4	7R	
Mary's s ad	6.9	1R	7/12
RT Hummingbird	"	"	
Dusky Cap Flyc h	6.7	8R	
SI hd Tody Flyc h	6.8	5R	
2 Bl hd Salt h, s	6.9	10L	
2 DuA Wren h	6.7	14L	
RT Hummingbird s	7.2	3R	
BT Saltator h	7.7	3R	
LB Gnatcatcher h	7.6	3L	
Mary's h	7.8	13R	
Blue Winged Warbler s	8.2	19L	3/5 Vireo
2 Tanager s	8.4	5R	7/12
Redstart ♀	8.7	13L	7/12
2 YT Oriole h	8.8	11R	
YB Cuckoo h	8.5	15L	
2 Variable s h, s	8.6	14L	7/1
Slatey tail Trogon s	8.4	5R	10/13
2 BC Wren s	8.8	8L	
GO Wren h	8.1	15L	
Scarlet King Tanager	8.4	4R	
4 Bl Saltator	8.5	12R	
Sp Br Wren h	9.1	11L	
OTT h	9.4	5R	Canoe
SI Wren Flyc h	"	"	"
RT Hummingbird s	9.5	9R	5/10
BT Saltator h	10.2	13L	

2 BC Titira s	10.2	13L	19/20 B. s
Wilson's h	9.9	9R	
RT Hummingbird	10.3	1L	
Wilson's h	10.3	4R	
YT Oriole h	10.3	4L	
Mary's h	10.4	10R	
YB Cuckoo	10.2	5R	19/15 Vireo
Panama s	11.3	1R	
2 B Saltator h	11.7	7L	
2 Sp. br Wren h	11.9	6R	
CSA h	11.8	15L	20/23
L Hermit s	11.7	1R	
RT Saltator s	11.8	6R	
Mary's s	11.9	10L	7/12
D. Antbird h	12.6	18R	
Wilson's h	13.1	5R	
2 YB Antbird s	13.6	4R	05/3
RT Antbird s	13.7	6L	Grand
2 YT Oriole h	13.8	12R	
2 Hooded h	14.3	8R	
Wilson's h	14.3	8R	
2 B Saltator h	14.2	15R	1/10
LB Sparrow h	14.3	14L	13/10
SP Br Wren h	14.3	11R	8/10
Scarlet King Tanager	14.2	13R	
Slatey tail Flyc h	14.3	4R	
Orange bill Sp h	15.5	16R	
Wilson's h	16.5	9L	
CSA h	16.8	15L	
YB Cuckoo h	16.7	19L	
Slatey Tody Flyc h	17.7	7R	
Violetaceous Flyc h	17.7	8R	7/12
Sp. saltator	18.8	10L	
2 DuA Wren	18.6	8L	
YT Oriole h	19.2	17L	
CSA h	19.2	20L	
LB Gnatcatcher h	19.9	12L	
Wilson's Wren h	19.8	7L	
Wilson's h	"	4R	
Wilson's h	19.9	20L	

9m

Shale Member A18 - furthest toward
localities in corner of pit exp-
ed band in analogo

Forest-Mary Lou Pl. 17 between 1942-50

Sombra point where survey makes
90° bend toward Lacantun. Point done
on Playa

Forest near Chon of 19

@ 22nd - 05/150 upstream 30m from
boque manchon bet. 2 fig
tugs.

Pl. 22 - nearest to Ejido gate -
seasonal anoyo?

12-23-70

100 Towhee 1 →	Tree Toad 1
W. Blackb. 11	Shielded upscaper ①
B. Blue Grosbeak	Volcano Trogon ①
B. Flycatcher 1	Chachalaca ①①①
LEFL 1	MT. Screech Owl ①
Red-tailed 1	Social Fly ①
Gr. Antbird ①	B. Fly ①

6/12/2019

Redstart (1)	Redstart (1)
M. Blackbird (1)	Ch. (1)
Tree Toad (1)	Ch. (1)
Sp. Wren (1)	Yellow Warbler (1)
LEFL (1)	Redstart (1)
Redstart (1)	Redstart (1)
Grayish Sapsucker (1)	Redstart (1)

15 June

Red-headed (1)	Chickadee (1)
ViBFL (6)	Redstart 1
Orchard (1)	Grackles 5
W. Wren 1	Rocky Bl. D. 1
Yellow Warbler 1	W. G. 1
	W. G. 1

C

755

Poi. Marcher Ps 17	811
Green Elaenia (1)	Myiag 1 ♀
VO Phc (1)	Red Phoebe (1)
Dusky Ant (1)	OR Euphonia (1)
Dr Owl 1111	BH Trogon (1)
YT Euphonia (1)	GR Sparrow (1)
Yellow Warbler (1)	Redstart (1)
B/G Elaenia (1)	YT Owl
RT Humming 1	Scalet Plover
Hooked 1	N. Waterthrush

140

825

YSEL 1	Wilson 1
YSEL 1	(Swat)
Manag 1	Birth Point 11
St. John's (1)	Kodjokoto 1702
Blk 10000 (1)	6.50 (11)

10 May 1911

052424

10221 839
 10222 839
 10223 839
 10224 839
 10225 839
 10226 839
 10227 839
 10228 839
 10229 839
 10230 839

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100
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Black Creek 1	Roadside Bank
Red Mountain	Carroll's
N. W. Ashburnham	30 Ashburnham
Northampton	Springfield
Yellow Rock	Clayton
BH Salt Lake	Aradon

20 FEB 85

18 MARCH 92

Species	Weight (g)	Wing (mm)	Tail (mm)	Notes
Red Cap Manakin	21.8	13R	637	
Goldie Manakin	21.1	13R	918	
RT Manakin	21.3	15R		
WST Manakin	21.1	15L	15/14	
LEFL	19.8	9R	14/23	
4 RCT Manakin	20.3	7L	5/20	
2 OWA Manakin	21.3	18L	Group	
VSAB Manakin	20.9	20L		
WAB Manakin	20.5	17L		
3 RCT Manakin	20.6	17L		
WAB Manakin	20.3	12R	10/22	
2 RCT Manakin	20.5	12L	8/13	
2 RCT Manakin	20.2	5L	10/14	
2 RCT Manakin	20.3	5L	9/14	
Tammy Wing Warbler	20.3	12L		
WAB Manakin	20.5	18L		
LEFL	19.3	13L	2/20	
Manakin	19.6	17L	7/7	
WAB Manakin	19.2	16L		

C

Vol. 11

1/3 yamulek

2000

11/21/21

2014-11-11

Yellow Creek

[illegible]

5. $\frac{1}{2} \times \frac{1}{2} = \frac{1}{4}$

[illegible]

0 1 2 3 4 5 6 7 8 9

Loach in bank

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100
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2000

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1940

Marion D.

637

518

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1422

520

4

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144

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100
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CUPSZ MATCO 7 March 92
Loudy ~~72~~

March 22
Sunday

13 March
morning breeze

2.1

720

Scalloped Kingfisher	11	13	Am. Osprey (1)
M. Blackbird	00	1	Painted Pigeon
Sp. Wren	(1)	15	Tay (1)
N. Warbler	1	5	House Wren (1)
R. Wren	1	6	W. Wren (1)
G. Wren	1	14	W. Wren (1)
T. Kingbird	0	WCS (1)	
Gray's Salt	0	GT 1	✓
WBC	0	Cardinal	(1)
W. E. Wren	0	500 Bush	1
Orchard	(1)	WFL	(1)

P. 2

Sunny 73-80

Gr Wren	1	Orch Oriole	1
Yellow Warb	1	Gr. Salt	1
YT Oriole	1	Ind Bunt	1
Trop Kingb	1	LEFL	1
Yellow Warb		Gr Sparrow	1
WCS	1	Chy Col Robin	1
Chas	1	Su+H	1
Tennessee Warb	1	Van Seede	1
Gr Salt	1	Lin wdrb	1
Sparrow	1	Social Fly	1
Stops Cuckoo	1		

Rec'd PT PLAN NADA 729

Q. 5. ~~PC. 761.4 MIN~~ 740

2			2
3	R30		10 10 10 10
8			10 10 10 10
			4
5			10 10 10 10
			10 10 10
			<u>18m</u>

P+6	PT	PCAN		757
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2			10 10 10 4	
2	130	10 10 10 10	10 10 10	101
			10 10 10	118
5	10 10 10 10	10 10 9		145
	10 10 10 10			
	10 10 10 10			
	10 10 7			
	1400			
	200			

P. 3

75130

[illegible]

20 March Covid

Species	Length	Wing	Tail
13C Mockers	18.4	17.2	15/22
12A N. Oriole	18.5	20L	
13B Grackles	18.7	20R	
13D W. Wren	17.6	11R	Cog
13E Tit	17.4	1R	
Sp. br. Wren	17.5	20R	
13A Towhees	17.1	19R	
13F Titmouse	16.8	7R	7/10
13G Tit	16.2	1R	12/15
13H Tit	16.2	7R	7/11
13I Tit	16.6	12R	
13J Tit	16.5	11L	
13K Tit	16.7	10R	
13L Tit	16.6	15R	
13M Tit	16.7	20L	
13N Tit	16.7	15R	20/6



Br Hummingbird	14.5	12R	
L. Greenlet h	14.7	8R	
Redstart h	14.7	7L	
Bentbill h	13.2	14L	
Turquoise Warbler S	12.7	11L	
Maggie h	12.6	18L	
Br Hummingbird	11.3	1L	
Chest Color Warbler h	11.3	4R	
Attila h	10.5	5R	6/15
2 Br h'd Parrot h	10.3	10R	26/16
North S	9.6	9R	1/2
Catb h	9.3	7R	3/4
2 R.C. Man o' w h	8.9	4R	2/4
R.C. Tanager	8.5	16R	
J. L. P. h	8.3	20L	
Waxb S	7.7	3L	1/10
L. demit S	7.6	1L	
Attila h	6.6	10L	
NOTA h	7.4	10R	
2 Catb h	6.8	11R	
" h	7.1	3L	
BG Dove 3, h	5.3	8R	9/10
GO Warbler h	"	10L	
2 Green Jay S	5.1	7R	13/4
Greenish Elaenia h	5.3	10R	19/14
Br Grosbeak h	5.3	6R	10/10
3 R.C. Man o' w h	5.1	5L	7/12

L.T. demit S	5.1	1L	
Lesser Greenlet h	4.5	10R	
WBW h	3.6	9L	
V. b. Warbler h	3.6	8R	
R. start of h	3.6	3R	4/5
Catb h	3.7	5L	
C.A. C.A.S.	8.50		
2 Lesser Greenlet	1.9	4R	10L
Bentbill h	3.3	13R	
R.T. Tanager h	7.8	19R	
2 Tanager h	6	18L	
12 Warbler Tanager S	1.2	2L	21/22
Green Elaenia h	1.2	15L	
L. demit 13K	0.9	9L	
Clay Col Pap h	0.4	20R	
Br h' h	0.2	2L	
Lesser Greenlet h	0.3	7R	
2 Or Oriole h	0.2	4L	
Catb h	0.1	10R	
<hr/>			
CACAO	19 MAR 92	19.7	8R
VO h	19.7	8R	
2 Redstart h	19.5	13L	24/22
Br Start h	19.5	15L	29/28
Br h' h	19.4	2R	27/28
Clay Col Catb h	19.8	18R	
V. b. Warbler h	19.4	16R	
3 Tanager h	19.2	2L	23/23
Catb h	18.9	19R	
2 Tanager h	18.7	17R	18/22
13K h	18.4	17R	
18R h	18.3	11L	2/4
Br Arch h	16.8	13R	
Greenish Elaenia h	17.5	18L	
110R h	17.8	6L	13/14
Lesser Greenlet h	16.3	10L	
1 Tanager h	16.3	3L	14/18
WBW h	14.2	9R	11/14
110R h	14.2	13R	
Br h' h	16.2	8R	2/28

OB Sparrow h	16.1	2R	9/78
VO Flyc h	16.3	15R	
BA Trogon h	15.8	20R	18/16
KE Towhee s			
LT Bunting h	15.5	2L	
Sepia Cap Flyc h	15.6	20L	
Red Ant h	15.3	11L	15/29
WB Wren h	15.1	5L	
WOW Wren h	15.3	20L	
2 YBFL h	15.2	2R, 10R	
BC W Flyc h	14.8	3L	
Gr Gr Flyc h	14.5	15R	
Ruddy tail Fly S	14.8	1R	bird day host
2 DNT Wren h	14.8	11L	
HA Tanager	15.1	6L	
2 L Greenlet h	14.3	16L	
Y Euphonia s	14.3	10L	12/14
Sepia Cap Flyc h	13.7	10L	
ESWA h	13.7	7L	17/20
Grst Green s	13.4	20L	4/22
Sky hd Wren h	13.5	11L	
AT Humm s	17.8	3L	10/22
Purple Crown Flyc	"	"	"
Sw W Wren h	11.9	17R	
MC Manakin h	11.4	6L	
WB Wren s	11.1	5R	7/7
YBFL S	11.5	2L	11/5

SWT I	11.5	2L	11/15
Red Ant h	10.4	3R	
S F Flyc h	9.6	17R	
Sw W Wren s	9.1	10L	14/22
Red Ant h	9.3	20R	
VO Fly S	9.1	11L	31/0
WOW Wren s	"	"	3/0
YBFL h	8.6	15L	
WOW Wren h	8.8	6R	6/20
Red Ant h	8.8	5R	18/20
WOW Wren h	8.7	8R	19/20
Sw W Wren h	8.3	10R	22/22
C. Green s	7.8	4R	15/12
Mugger h	7.5	20L	
WOW Wren s	7.5	12R	17/20
Red Ant h	6.9	5R	
YBFL h	7.2	16R	5/20
2 Gr Swift S	"	"	"
ESWA h	6.9	6L	
YBFL h	6.1	17R	15/26
Green Elaenia	5.8	12R	10/10
Gr Fly S	5.5	9L	13/27
S B Flycatcher s	5.1	CR	17/25
Viol. Trogon S h	5.2	OR	19/20
2 Wren s	2.9	5L	23/30
2 YBFL h	5.3	17L	17/35
Sw W Wren h	1.9	18L	15/21
ESWA h	2.1	12L	4/2
2 YBFL h	1.9	11L	1/0
Gr Fly h	1.8	20L	
2 YBFL h	1.1	11L	14/17
WOW Wren h	1.3	8L	9/4
Red Ant h	"	9L	3/3
Baw S	"	8L	9/10
Sw W Wren h	0.3	5L	
Gr Fly h	1.5	11L	
WOW Wren s	0.3	5L	7/9
ESWA h	1.1	8L	11/5
Yellow Warbler h	"	6L	

YR Flyc h	1.3	14L	7/14
YR Flyc h	0.2	2L	3/7
YR Flyc h	0.4	7R	0.5/4
YR Flyc h	0.3	6R	0.5/3
Wilson's h	0.2	2L	2 Days

ACIA AVAL 23 MAR Sunny 620

YR Seedcatcher h	19.7	2L	853
2 Sp br Wren h	19.7	18L	
3 B thr Salt h	19.6	6L	
Redst h o ad	19.2	6L	
YB Caccough h	19.4	9L	
D. Antb h	19.5	20L	
L. Hermit s	19.4	6L	
Tacamar h	19.3	19L	
B. quith h	19.1	14L	
D. Antbird h	18.9	10R	
2 D. A. Wren h	18.9	5L	
Yentoe h h	18.7	2L	
B thr Salt h	18.8	10R	
Wilson's h	17.8	3R	
L. Hermit s	17.9	0.0	
Spadebill h	18.3	10R	
2 YR Jays			
Gray Col. Rob h	17.7	15R	
Redst h h	17.8	8R	
WB Wren h	17.1	6R	1/4
Spot br Wren h	16.8	11L	

S. Ind T Flyc h	16.8	8R	
Wilson's h	16.6	3R	2/6
Redst o ad	16.6	3R	7/9
Spadebill h	16.4	9L	
2 Jays			

white vent
red legs
- Biggish
- Light disk on head, darker thru back
- Black eye - touch of wht rear of eye
- Black bill
- " line ext. from mid-eye to mid-bill

Wilson's h	15.9	2R	
2 B. A. Tanager h	16.1	9L	
2 Bushy Flyc h	15.7	7R	
Margay h	15.7	3R	
Wilson's h	15.2	7R	
S. Ind T Flyc h	14.8	14R	10/14
G. B. Spanner h	14.6	20L	
3 B. Ind Salt h	14.6	10R	
WB Wren h	14.4	8L	
Wilson's h	14.3	10R	
B. thr Salt h	13.8	5R	
Sc. Rump Tanager	13.8	1R	
Redst s o ad	13.9	1L	
Kraccari h	13.2	3L	
Wilson's h	13.1	3R	9/13
B. Antbird h	13.6	17R	
S. Ind T Flyc h	12.6	9R	
2 Sp br Wren	12.7	5R	
B. thr Salt s	12.8	20R	
Yell Wren h	12.4	1L	
Sc. Rump Tanager	12.4	8L	
B. Antbird h	12.3	9L	
Wilson's h	11.5	17R	
Wilson's h	11.5	5R	
Wilson's h	11.5	5R	
D. Antb h	11.5	6L	

14B Towhee h	11.6	10R	
Mourner k	11.3	20L	
Redstart h	11.3	6R	
MT Titra s	10.9	16L	Brown
Wilson's	10.9	11L	
Redstart s			
R. B. Spine-tail h	10.5	16L	
YB Cacique h	10.6	18R	
Mourner s	10.3	14R	
LB Tit h	9.8	7R	
Rub-thr Hum s	9.7	7R	
2 B-th Salt h	9.6	10R	
WB Woodcreeper s	9.5	12R	
Social Fly s	9.2	5L	early
2 Scarlet Pimp Tit h	9.2	6R	
CY Tit h	9.3	4R	
DC Fly s	9.1	9L	
YB Cacique h	8.9	10R	
Tenn Warb s	9.1	18R	10
B Antshrike			
YT Oriole h	9.3	20R	
GB Sparrow h	8.7	8R	
B-th Tit s	8.8	10L	
Vid Trogon s	8.4	4R	
Mourner W	8.7	2L	
B Antshrike	8.3	2R	
D. Antbird h	8.1	2R	

2 BC Warbler h	8.1	13L	
Mourner s	7.3	7L	
Wilson's h	7.7	8R	
" h	7.4	6L	
RTA Tanager h	7.5	16R	
GB Sparrow h	7.6	7R	
2 Sc Hum Tit h	7.2	13L	
Wilson's s	6.6	12L	
2 B-th Salt	6.7	14R	
Yell Warb s	6.2	9L	9/23
BT Tit h	6.2	11L	
B-th Salt h	5.8	7R	
Unicol Ralt h	5.9	5L	
OB Sparrow h	5.9	1L	
WCS h	5.5	5R	
D. Antbird h	5.8	8R	
2 BW Antbird h	5.9	2R	
Social Woodcreeper L	4.7	14R	
Social Wren h	4.8	5L	
2 YB Cacique h	4.8	20R	
T. Antbird h	4.1	1R	
Wilson's h	3.8	6R	
CICADAS		8.20	
L. Hermit s	4.2	0.0	
Soc Cap Fly h	4.2	1R	
YB Tit h	3.9	20R	
Lesser Greenlet h	3.6	2R	
Social Woodcreeper h	3.3	5R	
B-th Salt h	2.7	9L	
R-th Becard h	3.1	2R	25/27
Cinnamon Becard h	2.7	6L	
Ph Tail Hum s	2.4	9R	
2 BC Titra build nest	2.4	18R	9/29
YD Fly h	2.1	10L	
Redstart h	1.3	15L	
2 D. Antbird h	0.5	7R	7L
Mourner s	0.2	6R	

Cloudy, cooler
Boobye Mountain Loma

Pt 1 753
Sp br Wren (1) WB Emerald 1
Or br sp (1) B whr Salt 1
GB Sparrow 1 SUTA 10
Yell Warb 1 Redst 2
2 GNA Wren 11

Pt 2 807
M Blackb (1) Redst (1)
YBFL 1 f-hell Tyr 1
Sc Humptun 1 Sp br Wren 1
NW Waterthrush 1 Redst 10
Band Rached Wren (1) KB Towhee (1)
Guam (1) Redst 10
VO Fly (1) K hr A Tan (1)

Pt 3 Pt R 334
YBFL (1) CR Sparrow (1)
B sp 1 BH Salt (1)
O Anth (1) VO Fly (1)
RL Parrot (1) WB Wren
BR GRSbk (1) ~~Redst~~
Wooded 1 WB Casiquil (1)
A th la (1) L Greenlet (1)
Green Elaenia (1) K T Hummer
Redst 1 Clay Col Robin (1)
Red br A Tan (1) W Wren 1

Cloudy (1) 1BFL (1)

O Anth (1) CACAO at 19 915
Cloudy
WB Greenlet 1
O Anth 1
GB Wren (1) YBFL 1
Sp br Wren (1) W Wren 1
O Anth 1111 B & Orange (1)
VO Fly 1 Semplanchard
Wren (1) Redst 1
B & White (1) W Blackb (1)
GB Gnatcatcher (1) YBFL (1)
L. demet 1 GB Fly 1
WB Emerald 1

Pt 20 929
Redst 1 O Anth (1)
SUTA (1) G Anth (1)
Clay Col Robin (1) Chas (1)
W Wren 11 VO Fly 1
Sp br Wren 1 Sep Cap Fly 1
B & White (1) SUTA (1)
CR Towhee (1) VO Fly (1)

Pt 11
Pt 12 ~ 200 m upriver
13 ~ 250 m past culturo on right. Ret
can on right & scrub on left
14 ~ 140 m upriver Before giant cacti
& milpa
15 ~ 175 m upriver. Turn right on path
under Ceiba. Far west to right
~ 25 m on path

16 - ~200m from pt 15 Follow Mlpa

At huge tree fall in Mlpa
walk ~25m along camino
Near small willow thicket

17 - Along rio. Reach two track of
hacienda. Pt. 17 is in scrub ~30m
from rio on 2-track before
path turns to left

18 - ~150m from pt 17 along 2-track

19 - Follow 2-track ~175m till
path from right comes in ~30m
on path

20 - On 2-track past Casco
~250m

SRVB 25 March 92 Chajulio Sunny-Fog

CYT 11

PL 11 638

Melodius Blackb (1)(1) WCS 1

BBG (1) 1

LEFL 11

YBC 11

Palebill (1)(1)

N Roy Flyc (1)

Clay Col Rob (1)

Strip Cuckoo (1)

Ruddy Crane (1)(1)

Yell Warb 1

Br Jay (1)

B. Antsh (1)(1)

Sp br Wren (2)

Wing'd Dove (1)

new road head-high corn
on left and partially on it

Pt 12

Sun/Fog

653

CYT 1	WCS 1	(1)
Gray Salt 1	M Blackb (1)(1), 2	
Com Td Ph 1	Social Fly (2)	
Strip Cuckoo (1)	Red Iored Parrot (2)	
Vio T Trogon (1)	BBG (2)	
Sc. Lumpy Titm (2)	Kiskadee (2)	
Ochre'd Oriole (2)	Yell Warb (1)	
Gr Antsh (1)	Callbird (2)	

Pt 13

Sun/Fog

708

BBG 11	WCS (1)(1)	
Gray Salt (1)	Sc. Lumpy Titm (1)	
Br Salt 1	M Blackb (1) 2	
Gr Antshree (1)	Vio T Oriole (1)	
Ochre'd Oriole 1	Yell Warb (1)	
Trogon (2)	Red Iored Parrot (1)	
CYT (1)	WCS (1)	
LEFL (1)	Br Salt (1)	

Pt 14

Sun/Fog

721

Waggy 1	Com Td Ph (1)
Trogon (1)	Br Salt (1)
M Blackb 1 5/10	BBG (1)
Sc. Lumpy Titm 1	Br Jay 1
Vio T Oriole (1)	Kiskadee (1)
Ochre'd Oriole (1)	Red Iored Parrot 1
Social Fly (1)	Sc. Lumpy Titm (1)
Vio Fly (1)	WCS (1)
Br Salt (1)	Com Td Ph (1)
Waggy 1	M Blackb (1)
Vio Oriole (1)	Gr Antshree (1)
Sc. Lumpy Titm (1)	CYT 1
Trogon (1)	

P-15 Sun/Fog 710

B/G Tanager 11	Yan Seed 11
Social Fly (11)	Swallow 1
Comm TL Fly 1	Chat 1
Bluish Jay (1)	B/T Jay (1)
Gray Salt 1	Maya 11
VT Owl 2	Self Hell 11
Laughing Falcon (1)	G/Fly (1)
Wh. Sh. Hawk (1)	WBV 11
Yell Warb 10*	

P-16 Hazy 804 40

Right half of point clear now, in head high clouds

Yell Warb 1	Blue Gr Dove (1)
Gray Salt 1	W bill whisp (1)
Trop Kingb 1	Social Fly 11
Groove B/Tail 1	Chachalaca (1)
Med Blackb (1)	Y Owl (1)
Sld Tod Fly 1	

P-17 Hazy 824

WCS 1	YT Owl 1/11
BT Salt 1	Social Fly 11
Sh. Sh. Whisp (1)	Y Owl 1
Yellow Warb 1	Y Owl 1
DC Fly 1	B/G Tanager 11

WCS 1
RRG (1)
Yellow Warb 10*

VINTAN 1
YRRL (1) - tall tree
BCR (1) - camp

P-18 Sunny 839
WCS 1
Gray Salt 1
WBV 1
Tennessee Warbler 1
Maya 1
Wh. Sh. Warb (1)
B/G Tanager (1)

25% Scrub
VIOI Trogon (1)
Scarlet Flycatcher 1
Social Fly 11
RRG (1)
YRRL (1)
YR Caracara (1)

P-19 855
WCS 1
Med Black (1)

75% Haze Sunny
Sc. Flycatcher 1
Wilson's 1
BT Salt 1

P-20 Hazy Sun 918
A/B Spinedail 1 (1)
RRG 1
Rusty Cuckoo (1)
B/G Salt 1 (1)
Y Owl (1)

Sp. B. Wren (1)
Social Fly (1)
Gray Salt (1)
WCS 1
Chat 1

P-21 1, 2, 11-15
F#1, G#1, G#7, F#6

POINT COUNTS 26 MAR 838
P-21
L. Greenlet (1)
Y Owl (1)
Y Owl (1)
Y Owl (1)
Y Owl (1)
Y Owl (1)
Y Owl (1)
Y Owl (1)
Y Owl (1)
Y Owl (1)

B. A. Tanager (1)
G. C. Wren (1)
R. C. A. Tanager (1)
B. Tanager (1)
T. Tanager (1)
T. Tanager (1)
T. Tanager (1)
T. Tanager (1)
T. Tanager (1)
T. Tanager (1)

F.G. Pt 2

Slight drizzle G.S.S.

BF Grosbeak (1) OB Sparrow (1)

Sp br. Wren (1) Attika 1/

B. W. Salt (1) W. B. Wren (1)

O. Antbird (1) R. Mourner (1)

Gr. Antshrike 1 Mayay 1

WR Wren 1 Y. T. Wren (1)

MT. Wren 1 Y. B. L. Wren

L Greenlet (1) C. B. Becard

Kenricky (1) W. O. H. (1)

10 bill Wren (1) Sp br Wren (1)

Gr Sm Vireo (1) R. T. Jacaranda

Gr Antshrike (1) Mayay, Fruit (1)

B. W. Pol. Wren (1)

F.G. Pt 3 Cloudy Duplicate 738

Sl Tail Trogon (1) Y. B. Wren (1)

Sp br Wren (1) Sl br Wren (1)

R. T. Antshrike (1) B. T. Wren (1)

R. T. Antshrike (1)

R. T. Antshrike (1)

R. T. Antshrike (1)

Forest Gap 7 759

Redst (1) W. B. Wren (1)

Y. B. L. (1) R. T. Wren (1)

Sl br Trogon (1) Sp br Wren (1)

Attika (1) Gr Sm Vireo (1)

Wood Thrush 1 Mayay 1

Wood Thrush 1

Smoke & W. Wren (1)

W. B. Wren (1)

W. B. Wren (1)

Attika (1)

L. Greenlet (1)

Moat Moat (1)

R. Mourner (1)

Moat Moat (1)

Cloudy 8:02

Cloudy 8:02

Sl Tail Trogon (1)

W. B. Wren (1)

Sp br Wren (1)

Attika (1)

Sl br Trogon (1)

R. C. Wren (1)

R. C. Wren (1)

Gr Sm Vireo (1)

W. B. Wren (1)

Gr Sm Vireo (1)

Y. B. L. (1)

Gr Sm Vireo (1)

Y. B. L. (1)

Gr Sm Vireo (1)

Y. B. L. (1)

Gr Sm Vireo (1)

Y. B. L. (1)

Gr Sm Vireo (1)

Y. B. L. (1)

Gr Sm Vireo (1)

Y. B. L. (1)

Gr Sm Vireo (1)

Y. B. L. (1)

Gr Sm Vireo (1)

Y. B. L. (1)

Gr Sm Vireo (1)

Y. B. L. (1)

Gr Sm Vireo (1)

Y. B. L. (1)

Gr Sm Vireo (1)

Y. B. L. (1)

Gr Sm Vireo (1)

Y. B. L. (1)

Gr Sm Vireo (1)

Y. B. L. (1)

Gr Sm Vireo (1)

Y. B. L. (1)

Gr Sm Vireo (1)

Y. B. L. (1)

Gr Sm Vireo (1)

Y. B. L. (1)

Gr Sm Vireo (1)

Y. B. L. (1)

Gr Sm Vireo (1)

Y. B. L. (1)

Gr Sm Vireo (1)

Y. B. L. (1)

Gr Sm Vireo (1)

Y. B. L. (1)

Gr Sm Vireo (1)

Cloudy
Cooler

6 20
9:05

ARR PAS ED 27 MAR '92

LBFL h	11.8	18L	
BBFL h	11.9	16R	
SB Phycobates	11.1	2L	13/20
2 S House Wren	11.3	5L	
♀ Redstart	11.5	18L	7/7
Yellow Warbler	11.5	1R	1/3 ^{first bore}
BS Sault h	11.3	17L	
7 Sc. Purple Tanagers	11.2	14L	
Concoloris Cap s	11.1	3L	3/4
BBFL h	11.2	6R	
YBC h	11.1	7L	
Crowson Coll Tanager	11.4	6L	
W B Woodcreeper s	11.2	20L	3/12
2 Catbird h	11.1	18L	
Catb s	11.1	10L	1/5
2 M Blackbird s	11.2	9L	3/20
Sp br Wren s	11.2	8L	9/4
Clay Col Rob s	11.1	5L	4/4
Wren's Spar s	10.8	5L	2/4
BBFL s	"	"	3/1
Wilson's s	11.1	4L	1/2
WCS h	11.1	8L	
Mug s	10.6	14L	5/2
LBFL h	10.6	9L	
Br h Phc s	9.9	6L	6/2
Sulph bell Phc s	9.5		

15 FL s 9.9 712

Variable Doves	9.9	0.0	
2 Pale Vented P			
Variable Seede	13		
BC Woodpe	9.5	16R	11/14
ST Sault	12/12		
Small Ph s	"	"	17/17
2 Yellow Honeycreepers	9.1	13R	17/24
M B Black s	9.3	3R	8/11
BC Woodpe	9.2	5L	9/9
15 FL h	9.3	10R	3/20
LBFL h	8.5	3R	
Br h Sault h	8.3	10L	3/12
Buddy Wren	8.4	7R	
Mug s	8.6	11L	15/4
15 FL h	8.7	15L	
SB Ph s	8.5	12L	8/8
WCS s	"	12L	9/11
GT h	"	13L	
Marked Tanager	7.8	14L	10/11
2 YBC	"	16L	9/11
WCS h	"	10L	2/11
Wilson's Wood s	7.6	15L	10/11
WCS h	7.5	5L	
GT h	7.2	5R	
2 YBC h	7.7	15R	
WCS s	6.2	16L	
" s	6.4	17R	
LBFL h	5.2	712	
Clay	5.3	10L	
"	4.8	6R	6/9
Catb h	4.5	6R	1/2
WCS h	4.3	5R	3/10
Catb h	4.7	8R	
Catb h	4.1	4L	
L. Greenlet h	3.9	15R	
Wilson's Wood s	3.8	2L	3/4
2 YBC h	3.7	10R	0/11
GO Woodpe s	2.8	1L	7/8

Lean insect Lb plankt

No Oriole in OT	2.5	SR 7/5
2nd Bunt h	2.7	8R
LBFL h	2.8	7L
2 B/T Tanager h	2.5	7R
Sp Br Wren s	1.9	6L
2nd Bunt h	2.1	9L
Catb h	1.8	20R
LBFL h	1.6	7L
2 Sc Pump Tan OT	1.7	12L
Catb s	1.5	17R 9/5
W. Wren h	1.3	SR
Hooded o	1.2	2R 65/8
Redst ♀ s	1.3	12R
LB Tanager s	0.8	10L
Trop King s	1.3	20L 14/23
LBFL h	1.3	18R
2 LB Tanager	1.3	17R 15/23
Catb s	1.1	3L
CSWA h	1.1	5R 17/20
Wilson's h	0.9	6R
2 WB Wren h	12.1	20R
Wilson's h	12.2	3L 2/4
2 Sp Br Wren	12.3	13R
L. Greenlet h	12.3	10R
4 Tern Warbler s	12.4	3R 8/1
L. Hermit h LE	11	14R
2 B/T Euphonia h	11	16R

LBFL h		12.5	
W. B. C. h	2.8	SR 9/5	
W. B. C. h	12.4	SR 8/2	
Scrub Cuckoo	14.0	12L 1/6	
W. B. C. h	14.3	17L	
White-necked Puffin	16.7	15R 9/15	
Panama Wren s	17.4	7L	
LBFL h	18.3	20L	
2nd Bunt h	18.8	17L	
Catb h	19.2	20R	
2 Blue Grosbeak			
Jacoby	18.0	7L 4/2	
NA OT			
LBFL	11		
Redst	2		
Yellow	2		
Lincoln	2		
YBC	6		
Catb	10		
Wilson	4		
Mary	2		
W. B. C.	2		
W. B. C.	2		
W. B. C.	1		
W. B. C.	1		
2nd Bunt	3		
Hooded	1		
CSWA	1		
Tern	4		
16/54			

Cloudy → Pky Cloudy

905

UPLAND FOREST 28 MAR 02 810

R-thr Ant Tan h	0.4	16R	
Scaled Pigeon h	0.2	3L	24/24
Wreath Parakeet h	0.4	10L	10/10
Lesser Greenlet h	0.7	6R	05/21
DNA Wren h	0.6	20R	
L.T. Hermit s	0.5	2L	
R-thr Tanager h	1.1	17R	
2 D. Antbird h	1.3	3R	0.5/4
Sp br Wren h	1.2	19L	
Gr Jay h	1.4	15L	
Olivaceous subcap h	1.6	18R	
D. Antbird h	1.7	8L	
WB Wren s, h	1.7	1L	
B thr Tiger Heron	1.8	12R	7/5
L. Greenlet h	2.2	20R	
T. C. Greenlet	2.8	7R	
Mayan h	1.7	10R	
YBPL h	2.5	13L	
WorA h	2.6	18R	
2 O B Sparrow h	2.7	15L	
Green Sh. Vireo	2.5	2R	
Woth h	3.1	18R	
Bl faced Antbird h	2.7	11R	
WB Wren h	2.6	13R	
YBPL h	3.4	14L	
Gr Vireo	3.2	13L	27/32

B B Grosbeak h 3.9 20R

2 R-thr Tanager h	3.8	9L	
DNA Wren h	4.2	14L	
2 R-thr Tanager h	3.9	18L	
YBPL h	4.1	20L	
WB Wren h	4.2	10L	
Mayan h	4.3	5L	15/23
2 C. Sh. Call Tanager	4.3	7L	11
C. Sh. h	4.9	15R	
Hermit h	5.2	18R	
SR Phoebe h	5.4	4R	5/14
2 D. Antbird h	5.7	17L	
B. Antbird h	6.2	3R	2/24
O B Sparrow h	6.2	12L	9/10
L. Hermit h	6.3	1L	
2 Sp br Wren h	6.3	7L	
Cap Cap h	6.2	4L	4/22
2 T. C. Greenlet h	6.5	8R	
W. Sh. h	6.5	1R	11/24
L. Greenlet h	7.3	14L	17/24
CS h	7.5	10R	20/23
W. bill Wren h	7.8	19R	
W. h	7.6	10L	10/25
WB Wren s	8.1	19R	16/28
YBPL h	8.4	10R	7/13
YBPL s	8.4	3L	2/20
2 D. Antbird h	8.2	15L	24/30
3 D. Antbird h	8.5	7R	18/23
2 DNA Wren h	9.5	9R	14/23
L. Hermit s	9.4	1R	
2 D. Antbird h	9.4	9L	Vireo
2 C. Sh. h	9.5	17R	Gap
2 R-thr Tanager h	9.6	6L	
Pl. Antbird h	9.8	5R	7/12
WB Wren h	9.9	15L	
W. Sh. h	9.5	6R	
2 Pale bill Wren h	10.3	19L	
2 Sp br Wren h	9.9	15L	
YBPL s	10.3	6L	7/14
1 B. Antbird h	11	18L	

SUSA h	10.4	18L	
BC Titia h	11.3	7L	14/19
Snoby brown Warbler	11.2	13R	
GC Warbler	11.4	6R	4/5
W. Wren	"	11R	9/15
RC Ant Tanager	"	8R	3/15
2 Lesser Greenlet h	11.7	7R	
Swainson's Thrush	11.8	SL	2/30
CSUSA h	12.3	3L	26/28
Swainson's Thrush h	11.9	18R	
Sepia Cap Fly h	11.8	7R	
GS Vireo h	11.9	12R	12/2
WE Manakin h	12.2	12R	23/31
10 Yell Warbler	12.4	19R	
2 Sp br Wren h	12.5	14R	
BB Grosbeak h	12.4	20R	
YBT Wren h	12.5	19R	
TC Greenlet h	12.4	20R	
WB Warbler h	12.8	9R	35
OB Sparrow h	13.3	16R	
KA Fly h	14.2	4R	9/4
LT Humit s	14.1	2R	
17 Euphonia h	14.3	1L	15/22
2 Red ab H Tan	14.5	6L	4R
BB Grosbeak h	14.8	9L	5/11
2 BF Grosbeak	14.5	15L	
3 Catb s	15.7	5L	2/4
Gap			

B.T. Hummingbird	15.7	12R	
1 Red Manakin h	16.2	15R	9/27
W. Wren h	16.4	20R	
Redstart h	16.5	19R	19/30
YO Fly h	16.9	20L	
1 BT Warbler h	17.5	18R	10/16
W. Wren h	18.0	12R	2/16
2 Orange Wren h	18.5	8L	6/10
W. Wren h	18.6	18R	
CACHO 29 MAR 92	Cloudy	620	910
Redstart h	0.2	8L	
BH Sult h	0.1	8R	2/14
Catb h	0.1	10R	edge
2 M Redstart h	0.2	15R	
2 Sp br Wren h	0.9	12R	edge
W. Wren h	0.6	9R	1/4
CRS Tanager h	1.5		
PABCO - unknown bird			Scarlet s
Dusky Cap Fly h	1.1	18R	cult no
KT Hummingbird h	1.4	9R	
3 B Fly h	1.3	8R	19/30
Redstart h	1.3	1R	26/30
W. Wren h	1.8	5R	Cacao
YB Fly h	2.2	20L	
Swainson's Tanager	2.8	9R	find
3 YB Fly h	3.2	18R	25/26
Redstart h	3.2	9R	17/26
YO Fly h	3.3	3L	26/25
Mugger s	3.5	2R	
Look up migration patterns of source migrants in Costa Rica			
W. Wren h	4.2	17R	Cacao
2 YB Fly h	4.2	12L	22/28
Redstart h	4.3	8R	25/29
CSUSA h			
Look up similarity in voice bet Purple Bullfinch			

2 Masked Tanagers	5.1	1R	11/18
3 R. W. A. Tanager h	4.9	17L	
Y. P. h	5.1	15R	
H. h	5.1	1L	20/25
K. h	5.4	13R	21/22
S. h	6.2	10L	
Y. h	5.8	16R	13/13
R. h	6.5	9L	15/20
BT S. h	"	9L	"
No. h	"	4L	"
3 T. h	"	4L	"
Green h	6.2	15L	13/25
R. h	7.5	13L	13/12
S. h	7.5	16R	
2 Y. h	8.3	12	16/22
M. h	7.3	18R	10/16
L. h	8.3	10R	
M. h	8.7	5L	Cacao
OS E. h	8.3	12L	7/22
M. h	8.2	7L	
W. h	8.5	10R	2/4
"	8.2	11R	
H. h	8.7	9R	
C. h	8.2	5R	1/3
L. h			
B. h	9.7	8R	0/1
S. h	10.3	1R	19/24

[Swainson's Thrush]			
2 R. h	11.7	7R	3/4 Cacao
Y. h	11.5	10R	
Y. h	10.5	6.9	11/13
"	11.2	4R	3/11
S. h	11.8	18L	1/11
R. h	11.2	20L	
H. h	11.6	15R	13/17
R. h	12.4	18L	16/20
"	12.2	14R	9/14
W. h	13.5	8R	1/3 Cacao
Y. h	15.2	7L	
2 J. h	15.6	20R	
2 B. h	15.6	18L	
2 W. h	15.6	17L	8/25
S. h	15.8	3L	
C. h	16.1	12L	18/23
2 O. h	17.9	3R	10/12
W. h	15.8	10R	
2 L. h	15.8	5L	
E. h			
L. h	17.8	6L	1/3 Cacao
Y. h	16.8	6L	
Y. h	17.1	6L	7/9
L. h	16.9	20L	
Y. h	17.5	9L	2/3 Cacao
O. h	18.1	1L	
Y. h	18.5	5R	
Y. h	18.5	1L	24/27
Y. h	19.3	8R	Cacao
W. h	19.9	14R	

Ptly Cloudy → Cloudy

ACAPAL 30 MAR 92				620 920
SI hd Tody Phoe h	0.2	8R	1/3	
Roanoke Hawks	0.5	17L	2 1/2	
2 Brown Jay	"	"	"	chasing
PB Woodpecker h	0.1	5R	8 1/2	
2 Gold Wren h	0.1	5R		
Willow h	0.2	13L	3 1/3	
SH Fly h	0.4	3L		
BI Faced Antbird h	0.7	10L	1/25	Roost Patch
20 Ant h	0.6	8L		
Sc Rump Tan h	0.7	20R		
BC Woodpecker h	0.7	5L		
C. Swift	1.7	7L		
SI tail Trogon h	2.1	20R		
BI Antbird h	2.3	19L		
W. B. Wren h	2.8	5R		
L. Hermit s	2.9	3R		
YB Tyr h	3.1	9L	13/20	
Wilson h	3.8	4L	7/20	
YT Euphonia	3.5	1R	13/15	
Ovenbird h	3.8	8L	0 3/6	
L. Greenlet h	3.9	16L		
h B Greenlet h	4.1	6R	11/13	
B Antbird h	4.7	15R		
HL Honeycreeper	5.5	17L	8/25	
GB Sparrow h	5.8	15R		
Willow h	6.3	7L		

Chal. Coll Robin h				66 3R
B. Woodhewer h	6.8	7L	8/12	
SH Fly h	"	3L	0/1	
Sc Rump Tanager h	7.1	20L		
GB Sparrow h	7.5	11L	1/3	
Wilson Woodpecker h	7.2	16R	7/10	
Warbler h	7.2	11R		
2 Sp. Wren	7.6	18R		
2 Sc Rump Tan h	7.8	11L	7/10	
2 B. Flycatcher	7.9	13L	7/10	
BI Greenlet h	7.9	15L		
2 Smoky Brown Woodpecker	"	"	"	
Sc Rump Tanager	7.8	20L		
Greenlet Woodpecker	"	"	9/10	
B. B. Spinetail h	7.7	3L	0/2	
BI Greenlet Woodpecker	7.7	17L	24/25	
2 W. B. Flycatcher	8.1	12R	2/3	
B. Flycatcher	8.1	11R	Building nest	
B. Antbird h	7.9	3R	1/3	
2 BI Hooded Tanager	8.2	6L	7/8	
GB Sparrow h	8.1	21R	2/3	
2 A. Antbird h	8.3	2R	3/3	canal
2 B. B. Wren h	8.2	9L		
2 Social Fly h	8.3	15R		
B. B. Flycatcher h	8.3	7R		
2 B. B. Spinetail h	8.4	3R		
RTW h	8.3	14L	15/21	
2 Coll. Coll. Tan	"	"	2/12	
SH Fly h	8.5	1R		
SI tail Trogon	8.3	18L		
W. B. Flycatcher h	9.1	13R		
Sc Rump Tan s	9.2	11L		
B. Antbird h	9.3	17L		
2 B. B. Flycatcher	9.2	11R		
Squirrel eating		Acacia fruit		
YT Oriole h	9.5	16L		
2 Gold Wren h	10.1	18L		
Warbler h	10.4	5R	2/3	
2 Coll. Coll. Tan	10.6	17L	7/10	

W. bill underpoh	10.5	18L	
B. quith	10.5	17R	
2 D. Antb	10.4	3L	
B. Jay S	12.2	2L	9/13
Crow Coll Tanh	12.2	6L	1/13
2 B. W. Salt	"	"	2/13
Robot run	13.4	1L	6/9
2 Sp. Wren h	13.4	12L	
Crow Coll Tanh	"	5L	
→ Look up other voice			
2 Lomeated Wdpbr s	13.4	2L	10/14
Gr. Antshrike h	13.5	16L	
W. Wren h	14.1	15R	
L. Hermit s	14.2	1L	
Variable Cuckoo	14.4	12	7/10
2 B. W. Ant Tan h	14.4	17L	
B. h. Salt h	14.6	12	7/10
B. Jay S	15.3	3R	8/10
VER 1 Quilt			
2 B. Barch Wren s	16.4	60	6/9
Wilson h	16.5	12R	
L. Hermit s	17.2	3R	
2 D. Wren	17.8	2R	3/4
B. Antshrike h	18.1	5R	7
D. Antb. h	"	12R	
W. Euphonia h	18.3	5R	

Orch 01 07 chase Team. Wren h
B. W. Wren 1/1 - T

2 B. W. Salt	18.2	0.0	
Wren h	18.6	9R	
1 B. Wren h	18.5	1R	
Y. Wren h	19.1	2R	05/4
W. Wren	"	7R	
Gr. Sparrow h	19.4	18R	
2 L. H. Wren h	19.5	7L	
2 Sp. Wren s	19.4	6L	
Wilson	8		
CSWA	1		
Ovenbird	2		
RB G. Wren	1		
B. winged W	1		
Mamm. W	1		
Y. Wren	1		
Redstart	2		
1 C. Wren	1		
1 C. Wren	1		
FOLLOWING			
30 MAR '92		9 APRIL	
Mag. Yell. Tarr		Mag. Yell. Tarr	
Throat Tarr	3	BK/O	3
B. Wren	11	R/Y	7
Yell. Wren chase			
31 MARCH			
R/Y	7.8		
G/H	9		
B. Wren	4		
Y. Wren	4		
B. Wren	4		
1 APRIL			
BK/O	1		
3 APRIL			
W. Wren	8		
Y. Wren	8		
Y. Wren	11		
6 APR			
BK/O	1		
8 APR			
B	7		
C R/Y	8		

Ch. Parkers
30 March

Dr. Orchard Uncle No. 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 93, 94, 95, 96, 97, 98, 99, 100, 101, 102, 103, 104, 105, 106, 107, 108, 109, 110, 111, 112, 113, 114, 115, 116, 117, 118, 119, 120, 121, 122, 123, 124, 125, 126, 127, 128, 129, 130, 131, 132, 133, 134, 135, 136, 137, 138, 139, 140, 141, 142, 143, 144, 145, 146, 147, 148, 149, 150, 151, 152, 153, 154, 155, 156, 157, 158, 159, 160, 161, 162, 163, 164, 165, 166, 167, 168, 169, 170, 171, 172, 173, 174, 175, 176, 177, 178, 179, 180, 181, 182, 183, 184, 185, 186, 187, 188, 189, 190, 191, 192, 193, 194, 195, 196, 197, 198, 199, 200, 201, 202, 203, 204, 205, 206, 207, 208, 209, 210, 211, 212, 213, 214, 215, 216, 217, 218, 219, 220, 221, 222, 223, 224, 225, 226, 227, 228, 229, 230, 231, 232, 233, 234, 235, 236, 237, 238, 239, 240, 241, 242, 243, 244, 245, 246, 247, 248, 249, 250, 251, 252, 253, 254, 255, 256, 257, 258, 259, 260, 261, 262, 263, 264, 265, 266, 267, 268, 269, 270, 271, 272, 273, 274, 275, 276, 277, 278, 279, 280, 281, 282, 283, 284, 285, 286, 287, 288, 289, 290, 291, 292, 293, 294, 295, 296, 297, 298, 299, 300, 301, 302, 303, 304, 305, 306, 307, 308, 309, 310, 311, 312, 313, 314, 315, 316, 317, 318, 319, 320, 321, 322, 323, 324, 325, 326, 327, 328, 329, 330, 331, 332, 333, 334, 335, 336, 337, 338, 339, 340, 341, 342, 343, 344, 345, 346, 347, 348, 349, 350, 351, 352, 353, 354, 355, 356, 357, 358, 359, 360, 361, 362, 363, 364, 365, 366, 367, 368, 369, 370, 371, 372, 373, 374, 375, 376, 377, 378, 379, 380, 381, 382, 383, 384, 385, 386, 387, 388, 389, 390, 391, 392, 393, 394, 395, 396, 397, 398, 399, 400, 401, 402, 403, 404, 405, 406, 407, 408, 409, 410, 411, 412, 413, 414, 415, 416, 417, 418, 419, 420, 421, 422, 423, 424, 425, 426, 427, 428, 429, 430, 431, 432, 433, 434, 435, 436, 437, 438, 439, 440, 441, 442, 443, 444, 445, 446, 447, 448, 449, 450, 451, 452, 453, 454, 455, 456, 457, 458, 459, 460, 461, 462, 463, 464, 465, 466, 467, 468, 469, 470, 471, 472, 473, 474, 475, 476, 477, 478, 479, 480, 481, 482, 483, 484, 485, 486, 487, 488, 489, 490, 491, 492, 493, 494, 495, 496, 497, 498, 499, 500, 501, 502, 503, 504, 505, 506, 507, 508, 509, 510, 511, 512, 513, 514, 515, 516, 517, 518, 519, 520, 521, 522, 523, 524, 525, 526, 527, 528, 529, 530, 531, 532, 533, 534, 535, 536, 537, 538, 539, 540, 541, 542, 543, 544, 545, 546, 547, 548, 549, 550, 551, 552, 553, 554, 555, 556, 557, 558, 559, 560, 561, 562, 563, 564, 565, 566, 567, 568, 569, 570, 571, 572, 573, 574, 575, 576, 577, 578, 579, 580, 581, 582, 583, 584, 585, 586, 587, 588, 589, 590, 591, 592, 593, 594, 595, 596, 597, 598, 599, 600, 601, 602, 603, 604, 605, 606, 607, 608, 609, 610, 611, 612, 613, 614, 615, 616, 617, 618, 619, 620, 621, 622, 623, 624, 625, 626, 627, 628, 629, 630, 631, 632, 633, 634, 635, 636, 637, 638, 639, 640, 641, 642, 643, 644, 645, 646, 647, 648, 649, 650, 651, 652, 653, 654, 655, 656, 657, 658, 659, 660, 661, 662, 663, 664, 665, 666, 667, 668, 669, 670, 671, 672, 673, 674, 675, 676, 677, 678, 679, 680, 681, 682, 683, 684, 685, 686, 687, 688, 689, 690, 691, 692, 693, 694, 695, 696, 697, 698, 699, 700, 701, 702, 703, 704, 705, 706, 707, 708, 709, 710, 711, 712, 713, 714, 715, 716, 717, 718, 719, 720, 721, 722, 723, 724, 725, 726, 727, 728, 729, 730, 731, 732, 733, 734, 735, 736, 737, 738, 739, 740, 741, 742, 743, 744, 745, 746, 747, 748, 749, 750, 751, 752, 753, 754, 755, 756, 757, 758, 759, 760, 761, 762, 763, 764, 765, 766, 767, 768, 769, 770, 771, 772, 773, 774, 775, 776, 777, 778, 779, 780, 781, 782, 783, 784, 785, 786, 787, 788, 789, 790, 791, 792, 793, 794, 795, 796, 797, 798, 799, 800, 801, 802, 803, 804, 805, 806, 807, 808, 809, 810, 811, 812, 813, 814, 815, 816, 817, 818, 819, 820, 821, 822, 823, 824, 825, 826, 827, 828, 829, 830, 831, 832, 833, 834, 835, 836, 837, 838, 839, 840, 841, 842, 843, 844, 845, 846, 847, 848, 849, 850, 851, 852, 853, 854, 855, 856, 857, 858, 859, 860, 861, 862, 863, 864, 865, 866, 867, 868, 869, 870, 871, 872, 873, 874, 875, 876, 877, 878, 879, 880, 881, 882, 883, 884, 885, 886, 887, 888, 889, 890, 891, 892, 893, 894, 895, 896, 897, 898, 899, 900, 901, 902, 903, 904, 905, 906, 907, 908, 909, 910, 911, 912, 913, 914, 915, 916, 917, 918, 919, 920, 921, 922, 923, 924, 925, 926, 927, 928, 929, 930, 931, 932, 933, 934, 935, 936, 937, 938, 939, 940, 941, 942, 943, 944, 945, 946, 947, 948, 949, 950, 951, 952, 953, 954, 955, 956, 957, 958, 959, 960, 961, 962, 963, 964, 965, 966, 967, 968, 969, 970, 971, 972, 973, 974, 975, 976, 977, 978, 979, 980, 981, 982, 983, 984, 985, 986, 987, 988, 989, 990, 991, 992, 993, 994, 995, 996, 997, 998, 999, 1000

VEGETATION SAMPLING - 31 MAR '92					
Unit	Cult	Ta	La	Ma	S2 ⁰
0-1R		100%	[20]	[55]	
		6mossy			
0-1L		80	10	10	
		2 tan			
1-2R	100 (chub)				
1-2L	100 (mole)				
2-3R	100				
2-3L		95	5		
		6 herb/ho			
3-4R		95	5	+	
3-4L		95	5		
4-5R		90	10		+
4-5L		85	15		+
5-6R	85	9	6		
	Marce				
5-6L	100 (Marce/chub)				
6-7R	95 (Marce)		5		
6-7L	100 (Marce)				
7-8R	95 (Marce/chub)		5		
7-7L	100	" "			
8-9R	30	70	+		
	chub	herb			
8-8L	30	70	+	+	

CIT and choco waste waste

Monoboo
to mo orch. oriole Loma B. Riquena 9/1 Cerec.

- drinking from fruit that's been torn open					
	Cult	Ta	SS	MS	S2 ⁰
9-10R	25	75			
	Marce/chub	herb/ho			
9-10L	25	75			
10-11R	85	10	5		
	Marce/chub				
10-11L	90	10			
11-12R		90	10		
		herb/ho			
11-12L		90	10		
12-13R		85	15	+	
		herb/ho			
13-14R	50*	50	+		
		herb/ho			
13-14L		90	0		
		herb/ho			
14-15R	100*	95	5		
14-15L		95	5		
15-16R		80	5	15	
				per	
16-17R		95	5		
		85	10	5	
		herb/ho			
17-18R	65*	90	10		
		90	10		
		herb/ho			
18-19R		90	10	5	
		90	10	5	
		herb/ho			
19-20R		85	6	6	3
		herb/ho			
		90	45	15	

Sunny 20-900

HRB PAST EDGE 1 APRIL '92

Catb h	19.7	6R	0.7/4
Catb h	19.7	10L	
RT Hum h	19.7	10R	
LT Hum h	19.7	4L	
ICB Cowbird h	19.8	14L	2 1/2
Hum h	18.9	7L	3/6 carry nest
LEFL h	18.8	13L	5/9
Catb h	19.1	20R	
Blue Grosbeak h	18.2	20R	3/4
Catb h	18.7	9L	
" s	18.5	8R	
YBC h	18.5	15L	
[Swainson's Thr]			
LEFL h	17.2	20L	
Catb h	"	20R	
2 Rufous Tanager	17.1	16R	
DB Euphonia h	16.9	20R	
2 BB or off	11.5	5L	0.5/
CFT h	14.6	11L	
LEFL h	13.8	5L	
TB Seed Finch h	13.6	4R	0.5/2
CFT h	14.1	9R	T9
Migay h	13.7	14R	3/4
2 B-th Salt	13.7	20R	
L. Hamit LEK	12.9	12L	
LEFL h	12.8	3R	

N. Son's L

LEFL h	12.7	5R	3/4
2 Less Green s	12.6	2L	
2 Sp Br Wrens	10		
2 Clav Col Robins	8	12.1	9R
2 Catb s	8		
OW Elaenia	9	1/4	
M Tanager	11		
LEFL h Chabele 2			
Catb h	12.2	70L	
Blw Wren h	0.5	10L	
Catb	0.4	20R	
D.C. Flyc s	0.6	10L	
Wren h	0.9	2R	
Rufous Merganser	0.8	8R	
Social Fly h	1.1	0.0	10/0
LEFL Chabele	0.2	7R	
2-rd Bant h	0.8	11L	1/1
BBC h	0.9	7L	
Rufous Tanager h	1.2	10R	1/2
WIS s	0.5	12L	
RT Hum	0.8	3R	
Catb h	1.3	3R	
VR h	0.7	19R	
IT h	0.9	15L	
Catb h	1.6	2R	1/8
2 S-rump Tanager	1.8	2R	
Little Hum s	1.2	1R	
LEFL h	1.6	15L	1/2
Ovenbird h	2.1	14R	1/5
LEFL h	2.1	8R	1/9
Crim Coll Tanager	2.3	6L	
Sp Br Wren h	2.3	9R	
Catb h	2.1	10R	3/8
LEFL s	3.5	2R	1/5
Catb h	3.7	11R	
- look up group Salt h			
LEFL h	4.7	4R	

Br. Jays	19	3R	2/13
Carb h	4.4	17R	
Bentbill h	"	20R	
Th bnd Seed Finch	4.9	10R	
CYT h	4.4	13L	
Redst R	5.6	13R	2/5 Sol + shrub
WCS h	6.1	18L	
13 CYT h	7.5	7R	
UBFL h	7.3	8L	2/9
Redst immo	7.3	8L	4/9
Carb S	7.6	7L	2/13
CYT h	8.1	2R	4/4
Reddy Cuckoo	7.5	17L	
LT Hermit	7.3	1L	
UBFL h	"	5L	
MT Hum S	7.2	11L	3/3
UBFL h	7.7	2L	
Carb S	9.4	6L	
2 Mol Blackb	9.6	10L	
3 Redcr Parakeet	9.5	19L	
2 Socool Fly	9.6	10L	
2 M Tanager S	9.4	12L	5/6
Bulu Sult S	9.5	16L	5/12
WCS S	9.7	20R	
2 Th bil S Finch	9.8	2L	2/3/4
2 B. Antbird h	10.3	5L, 17R	
Bl chl wdr S	29.9	15R	11/16
Sulph bel Fly S			

13 BG h	10.2	41	
UBFL h	9.8	2R	
MT Hum S	11.1	1L	
2 BG Fly h	11.4	10L	
Oreoch h	11.4	7L	Shrub 9
2 Reddy Fly h	11.5	21	3/5 shrub
2 1 Red Fly h	11.7	9L	
2 WCS	11.6	10L	
5 13 BG	11.9	2L	
2 Th bil S Fly h	11.8	5L	2/4
WCS S	11.9	2L	
Socool Fly S	11.7	10L	22/23
Green Elaenia	11.8	3L	8/13
2 M Tanager h	11.9	2L	21/21
Yellow Warbler	"	"	19/21
2 Reddy	"	"	18/21
UPLAND ROOST 2 APRIL 1972			
Sunny 60-630			
Reddy Fly h	19.5	20L	9/5
4 WTA Wren h	19.6	"	
10 Red Tanager	"	"	
13 S Tanager h	19.3	16R	
1 Greenlet h	18.8	14R	
5 Redstart h	18.5	17R	
B. Green h	18.7	13R	23/38
6 Yellow Warblers	18.7	19R	11/25
Plum Red Wren h	18.5	16L	6/25
W. Wren h	18.2	12L	4/2
2 R. Red Wren h	17.8	15L	
Reddy Fly h	18.3	16R	
2 R. Red Tanager	18.4	5R	1/5
Maya h	18.1	20R	
13 BG h	17.6	18L	2/23
2 GC Wren h	18.4	16R	
6 Red Fly h	17.4	6.0	10/15
1 Hooded bill Fly	17.3	8L	23/30
1 Reddy Fly h	"	5L	20/30
4 Wren h	17.3	17L	2/30
2 Reddy Fly h	16.9	14R	
2 W. Wren h	15.8	11L	6/4

RCA Tanager h	15.5	6R	1/5
BB Grosbeak h	15.1	18R	
W. H. S	15.4	1R	5/9
Bl Ch Wdpr h	15.2	11L	
L. Hermit h	15.3	1L	
Sp. Wdpr h	14.5	20R	
B. H. Salt h	14.5	18R	
U. B. Euphonia l	14.6	8R	17/20
W. bill W. Tanager h	14.3	20L	
Kentucky h	14.3	12L	1/18
2 BB Grosbeak h	14.4	14L	
Orange bill Sparrow	14.4	5L	1/3
2 BB Grosbeak h, s	14.3	7L	1/11
No Royal Flyc h	14.2	16R	
2 C. C. Warbler h	13.9	7R	6/19
4 MT A Tanager s	13.4	2R	2/20
2 E. Y. King Warbler h	13.2	2L	"
W. B. Wren h	13.3	13R	
B. & G. Green ? sp. w. 13.3	13.3	10L	
Sepia Corp Fly h	12.9	7R	9/29
W. B. Wdpr h	12.6	17L	
R. C. Manakin h	11.6	20L	
2 W. B. Wren	10.7	10R	
C. C. Flyc h	10.8	18L	
Dusky Antb h	10.6	18L	
2 MT A Tan h	10.6	20R	
Shoreline Fly S	10.4	7L	5/9

W. B. Wren h	10.4	10L	
2 MT A Tanager h	10.3	17L	
W. B. Wren	10.3	15L	
Dusky br Wdpr h	10.5	16L	
W. B. Wren h	9.9	17L	
L. Greenlet h	10.1	16R	
Sp. Wdpr h	9.7	6R	
W. B. Wren h	9.5	6R	
2 CAT Tanager s	8.9	16R	3/18
L. Greenlet h	8.2	9R	
W. B. Wren h	7.6	6R	7/28
TC Greenlet h	7.5	12R	
2 CAT Tanager h	7.4	21R	
W. B. Wren h	7.2	20L	
C. C. Flyc s	8.30		
Vio. C. Flyc s	6.8	17R	
V. B. Flyc h	4.4	16L	
U. B. Wdpr s	4.5	8R	2/29
S. billed Pigeon h	4.3	6L	
W. C. Manakin s	3.7	11	25/18
L. Hermit h	3.1	1R	
Sp. Wdpr s h	2.8	3R	2/11
2 MT A Wren h	1.5	12L	
Chloral Rob h	1.4	20R	
W. B. Wren h	1.1	15L	
Rob. Wren h	0.7	15R	
V. B. Flyc h	0.5	18L	
W. C. Manakin s	0.5	7R	
B. Antb h	0.9	17L	
L. Greenlet h	0.5	16R	
W. bill Wdpr h	0.5	17R	

Abies grandis

50

CHERO ZAFFEL 92

W. B. Wren h	19.6	11L	
W. B. Wren h	19.7	8R	0/4
W. B. Wren h	19.8	16R	3/4 Cacat
W. B. Wren h	19.8	18L	
W. B. Wren h	19.6	10L	
W. B. Wren h	19.7	10L	
[E. W. P. Wren]			
Y. O. P. h	18.2	16L	
R. B. Wren h	19.1	5R	
Y. W. Tanager h	18.7	9L	20/30
B. W. P. Wren h	18.5	16R	12/12
Tanager W. B. S	18.5	14R	26/52
Lesser Greenlet S	"	14R	"
Redstart h	18.7	7R	
" ♀	17.6	14R	15/23
B. T. W. S ♀	17.7	13L	28/22
Wren h	17.6	7L	4/9
W. B. Wren h	17.2	20R	
Redstart Wren h	17.2	16R	21/24
Green Elaenia h	16.7	19L	9/11
S. C. P. h	"	17L	
Wren h	16.5	15L	
W. B. Wren h	16.7	18L	
W. B. Wren h	16.7	3L	
Redstart ♀	16.7	5L	8/9
W. B. Wren h	16.7	9L	13/14

D. J. Webb 16.7 9/10/14

[illegible]

C

Mary h	10.2	11	
2 No. Oriole h	10.1	2R	7/10
RRP h	10.1	7R	15/18
YBR h	10.1	14R	6/8
2 M. Tanager c	10.1	18R	
Hooded h	9.8	6R	1/2 L
B. Vireo h	9.8	7R	
2 B. Vireo h	9.7	5R	
Summered Thr c	8.3	20R	8/14
Green Gnatcatcher h	8.4	18R	
Y.O. Flyc L	8.3	5L	
Redstart h	7.5	6R	
C. T. A. h	6.9	6R	16/27
Slaty-tail Tanager h	6.2	11L	17/19
2 B. B. Warbler h	5.9	5R	11/27
W. bill Warbler h	5.7	10L	16/28
Gr. h. Warbler h	5.7	8R	
Wren h	3.5	18R	
Sup. Red Fly h	3.5	16L	
B. T. S. h	3.4	7L	5/23
H. Warbler h	2.2	11L	9/3
Loop Warbler h	1.8	15L	
Green Elaenia h	1.7	14L	
Wilson's Warbler h	1.4	8R	Green
Mary h	1.1	13R	1/3
Red h	0.4	3R	
C. h	0.5	7R	
2 M. Tanager h			

Cash h 0.3 6R edge
LOFL h 0.1 9R mid-a

ACTUAL 4 APR 92				6:10-9:10	
	AFR p.m. Rem	OVERCAST			
D. Antio h	19.8	18L			
S. Oriole h	19.8	5R			
Wilson's h	19.7	7R			
B. Vireo h	19.2	7L			
W. bill Warbler h	19.6	15L		10/12	
2 B. B. Warbler h	19.5	20L			
2 B. B. Warbler h	19.5	17L		8/10	
GB Sparrow h	19.2	4R			
S. Oriole h	19.1	10L			
LB Sparrow h	19.1	15L			
GB Sparrow h	18.7	12L			
2 B. B. Warbler h	18.7	6R			
2 S. Oriole h	18.6	7L		11/4	
Wilson's h	18.7	12R			
W. bill Warbler h	18.4	4L			
2 B. B. Warbler h	18.7	19R			
W. bill Warbler h	18.6	20R			
2 S. Oriole h	18.5	6R			
2 Wilson's h	18.3	8L		9/5	
W. bill Warbler h	18.5	3L		11/5	
GB Sparrow h	18.2	12R			
Wilson's h	17.9	1R			
Sparrow h	17.7	8R			
B. Vireo h	17.8	7L			
Clay col. Warbler h	17.8	10R			
2 Wilson's h	17.6	9R			
Coat. Thrasher h	17.4	12L			
W. Tanager h	17.4	17L		21/25	
2 B. B. Warbler h	17.5	25L		3/4	
W. bill Warbler h	17.5	1R			
Wilson's h	16.8	11R		4/4	
Wilson's h	16.5	0R		4/4	
Wilson's h	16.4	7R		7/11	
2 S. Oriole h	16.3	3R			
D. Antio h	15.7	3L			
2 B. B. Warbler h	15.5	5R			
2 B. B. Warbler h	15.4	18R		4/9	
B. B. Warbler h	15.1	6L			

Comm. Becard h	11.7	12R
V. Euphonia h	14.7	GR
GoB Sparrow h	14.8	18L
Br. Jay s	15.1	3R 7/4
L. Hermit s	14.8	R
3 Br. Salt	14.5	9R 7/10
Redstart h	14.7	10L
3 Maculinea c	14.4	17L 8/11
Ovenbird h	14.4	2L 1/3
Spadell h	14.2	5R
OR. Sparrow h	14.1	5L
2 Sp. Wren h	13.9	10R
Sh. LA Wren h	14.3	5L
Agila h	14.5	9R
GoB Sparrow h	13.9	12L
Wilson h	13.7	10L
2 Linn. Wren h	13.8	00 1/2 R
Smoky brown h	13.9	8L
P. Bull. Wren h	13.7	10L
Bl. faced Antthrush h	13.3	6L 1/2
2 W. bill Wren h	"	7L
Brantshorn h	13.4	20R
Wilson h	12.4	4R
12 Br. Salt s	12.1	18R
Yellow Wren	12.8	19R 1/2
2 D. Antbird h	12.9	20R
[Plumb Kite - Bullocky nest]		

2 GR Sparrow s	12.2	4L 2/12
1st Hermit s	12.3	R
2 Sp. Wren h	11.3	6R
Redstart h	11.6	2R 1/14
Br. Jay h	11.6	3R
Sh. LA Wren h	11.8	12L 1/14
Comm. Cal. Sparrow s	11.6	20R 1/12
2 Maculinea	11.5	4L
Wilson h	"	"
Wilson s	11.6	2R 10/11
Wilson Wren h	11.5	20L
2 GR Sparrow h	11.9	1L
Sh. LA Wren h	11.5	15L
Wilson s	10.8	11L
4 Sp. Wren s	10.9	15L
Sh. LA Wren s	10.8	18L 1/15
2 Sp. Wren	10.8	6L 1/15
2 Wilson Wren s	10.8	16L
Wilson Wren s	10.8	18L 1/15
Wilson	10.6	5L 1/15
Wilson Seed h	10.8	7R 1/15
Wilson h	10.8	18L 1/15
Wilson s	9.8	15R
Wilson s	9.2	16R 7/11
Wilson h	9.4	2R 9/12
2 D. Antbird h	8.7	5R
2 Wilson s	8.7	18L 13/26
Wilson h	8.9	3R 1/15
Wilson h	7.8	20L 7/15
Wilson h	7.2	2R
3 Wilson s	7.3	19L 1/12
Wilson h	6.8	17R
Wilson s	6.3	6L 10/13
Wilson s	6.8	3L 1/3
Wilson s	6.7	5L
Wilson h	6.8	19L
Wilson s	6.8	2R 8/10
Wilson h	5.7	15L
Wilson h	5.8	15L

Sun 10/10 → Sunny (clouds)

600

850
910

1st HA + Fly h

5 4 5 L Can

2 DWA Wren	5.2	201 V
B. Jay S h	4.8	SR Can
D. Antbird h	4.8	9L 7
Magnus h	4.2	42 12/15
GB Sparrow h	4.2	20R
LEP s	4.4	20R 4/5
Nodded → s	3.8	11 2/27
2 OR Sparrow h	3.6	2L
Pebra → ad	3.6	21 8/10
2 YB Cacique h	3.7	14L
L. Greenlet h	3.4	10L
2 HCA Tanager h	3.4	14L
1 SWA h	3.4	6L 9/9
Sw. br. Alder h	3.1	2L 7/10
Wh. Wren h	2.7	15L
2 YB Wdpt h down	2.5	5L
L. Wren h s	2.1	1R
Sulph bell Fly h	1.7	13R
Yend. Fly h	1.6	17R 3/3
Wd bil Wdpt h	1.5	10L
LT Acorn s	1.4	1L
BB Jay h	1.2	161
Cinn. Becard h	0.6	8L
Wilson h	0.3	18L

ARC First EGGS

1st HA h ad	11.8	13L	15/16
1st HA h	"	10L	
1st HA h	"	17L	
1st HA h	11.7	1L	
1st HA h	11.3	141	
2 BCB s	11.1	2L	
2 Chat h	11.6	18L	
Mashed Tanager	11.3	81	7/7
2 BCB s	11.8	19L	
2 BCB s	11.8	18L	3/3
2 " h	11.3	121	
Sulph bell Fly h	11.2	5L	9/9
2 SC Rump h	"	10L	
2 Ruddy Gd Rose	11.2	4L	3/5
Rose br Gd Rose	"	"	"
Sh bil s Trench h	11.1	5L	
2 YB h	10.9	5L	
BBG s	10.5	16L	
Magnus h	9.7	20L	
1st HA h	"	"	
GB Sparrow h	9.3	2L	
1st HA h	9.5	7R	
1st HA h	9.3	15L	
1st HA h	9.5	7L	
1st HA h	9.5	20L	
1st HA h	9.5	18L	
1st HA h	9.1	8L	
1st HA h	9.2	17L	
2 SC Rump h	9.1	20L	
Yellow Warb h	9.2	14L	12/13
1st HA h	8.9	8L	
1st HA h	9.2	12L	
1st HA h	8.9	17L	
1st HA h	9.3	4L	9/10
1st HA h	9.7	12L	2/10
1st HA h	9.1	20L	
1st HA h	8.5	15L	3/4
1st HA h	7.8	15L	
1st HA h	8.1	1L	

C

Redstart imm	8.1	11L	4/9
Redstart imm	7.8	0.0	
Waterthrush	7.7	0.0	
Buddy Creeper	7.8	8R	
2 Sp. Hum. Tanager	7.3	5L	3/3
Catbird	7.5	5R	
WBL h	6.1	8L	
Chat s	6.3	20R	4/4
Violet Sabrewing	5.8	5L	1/1
BBG s	5.5	10R	
White Hermit s	4.9	1R	0.5/8
Wh. Hummingbird	4.2	12R	
W. A. Tanager h	4.6	15R	
3 gnatcatchers	4.3	9L	4/4
2 Catbird h	4.1	6R	
WBL h	4.4	5R	
Green Col Tanager	4.3	5R	
Wilson's h	3.8	7L	
Redstart s	3.2	8R	7/7
Ovenbird s	3.6	2L	1/6
Chat h	3.4	9L	2/2
WBL h	2.6	10L	
2 Sp. Oriole h	2.1	11R	
SUTA imm	1.7	6L	2/2
Card s	1.8	1L	
5 Orch Oriole s	1.2	3R	4/25
3rd Bunt	1.4	9R	6/7

Or Or } Learn, Col. Plover 12/10 12/10

2nd A. Tanager	1.3	12R	4/7
WBL h	1.2	6R	
Bl. Ch. Warbler	1.2	15R	
2 Catbird	1.3	19R	14/18
2nd Sp. Oriole	"	"	"
Chat h	0.9	8L	
SUTA imm	"	"	"
2 Sp. Oriole	"	"	"
2 BBG s	0.7	3L	
W. Oriole h	0.9	15R	
Clay Col. Oriole	1.1	15R	
WBL	0.8	11R	
2nd M. Oriole h	0.8	10R	
Card s	0.8	11R	3/3
Bl. Ch. Warbler	0.8	11L	9/13
Orch. Oriole s	12.1	13R	12/15
3rd Oriole s	12.2	13R	14/15
8:00 CACADAS			
2 Sp. Oriole h	12.3	15R	
Chat h	12.6	20L	
"	12.8	7L	1/7
2nd B. A. Oriole	15.5	10L	
PT Oriole s	16.5	9R	
2nd Oriole s	18.8	19L	5/15
W. Oriole s	19.1	2R	

Overcast
MUGGY

600-650

Happy BD Mom

UPWARD FORST 7 APRIL '92

OB Sparrow h	0.1	20L	
WB Wren h	0.2	17R	
"	0.1	8R	
High red eyed vireo song - shiner	0.2	7R	2
" not Solitary			
P. Antbird h	0.3	11R	
Wren h	0.4	15R	8 ggg
"	0.6	20L	
Spot breast wren h	0.1	18L	
Kentucky W h	0.2	20R	Gup
B. gnatcatcher	0.6	9R	17/20
Sw. br. warbler h	0.6	17R	
2 D. Antbird	1.2	22R	1/4
YB Cuckoo h	1.1	10R	
2 BH Salt h	1.5	6L	
2 Rose line Becard	1.7	18R	7/11, Gup
2 Great Curassow	1.9	8, 20R	4/14, 1/20
Sepia Cap Fly h	1.8	10R	
L. Hermit h	2.9	1L	
2 BB Grosbeak h	2.7	17L	
Y. h. A. Tanager h	3.4	10L	
2 G. Warbler h	3.2	2R	3/5
D.C. Flyc h	3.9	6L	10/22
W. bill Wren h	3.7	20L	
Sep. Cap Fly h	4.3	13R	4/12
L. Warbler h	4.1	3R	4/28

WB Wren h	4.7	12R	
OB Sparrow h	4.2	4L	
Rob. Grosbeak h	4.3	7R	3/11
2 BH Salt h	4.5	20R	
Y. h. A. Tanager h	4.4	15L	Gup
T. C. Grosbeak h	4.5	20R	
W. P. Warbler h	4.8	13R	8/10
Red. Warbler h	4.3	8L	
R. faced Antbird h	5.4	15R	
2 BH Salt h	5.8	10L	
L. Warbler h	5.6	7L	20/27
R. Warbler h	6.3	20R	25/33
Sep. Cap Fly h	6.5	7L	2/2, 2/5
G. Warbler h	6.4	6R	29/35
W. Warbler h	7.2	10R	3/22
R. A. Tanager h	7.3	11R	
L. Hermit h	7.1	3L	
Del. bel Fly h	7.1	5R	8/1
W. Warbler h	7.1	8L	20/30
Y. h. A. Tanager h	8.4	20R	
W. Warbler h	9.1	11R	
S. Warbler h	9.4	7R	
2 Wren h	9.3	5L	20/20
L. T. Hermit h	9.5	1R	3/5, 1/20
Sulphur wing Fly h	10.2	5R	
Y. h. A. Tanager h	10.7	10R	Gup
Y. h. A. Tanager h	10.9	5R	
Y. h. A. Tanager h	10.6	5R	20/20
Y. h. A. Tanager h	10.4	11L	4/8
3 BB Wren h	10.3	15R	
Y. h. A. Tanager h	10.5	1L	13/22
Y. h. A. Tanager h	10.7	15R	
Sep. Cap Fly h	10.9	15L	
Y. h. A. Tanager h	10.8	3R	
Y. h. A. Tanager h	10.9	2L	12/18
2 D. Antbird	11.0	15L	
L. Warbler h	11.1	7R	
Ovenbird h	11.2	15L	

L.T. Hamish	11.3	0.0	
Wilson's h	11.3	14L	2/11
YBFL h	11.5	15R	6up
Coat Flyc h	13.1	2L	25/25
Bl Mr Shu Tan h	13.5	20L	
TS. C. Greenlet	13.7	6R	5/10
2BR Cerroble	13.7	6R	15/17
Bl Mr Fol h	14.2	12L	1/2 gap
2 DWAN h	14.6	10L	
Kendrick h	14.7	3L	1/3 gap
WB Wren h	14.7	20L	
Red h	14.3	8R	
Attilan	14.6	20L	
2 Kentucky	14.8	17L	
Bl Mr A Tan h	15.1	20R	
2 TC Greenlet h	15.3	3L	6/22
Castro S	15.5	5L	5/6
2 RB Toucan h	15.7	10R	30/20
Kendrick	16.3	20L	
Double 200 h	16.9	18L	25/20
Wilson h	"	19L	2/29
Muga h	17.5	NR	
Eye ring flyc h	18.2	1L	3/30
WB Wren h	18.1	10L	
2 Sp br Wren	18.3	12L	4/30
WOT h	18.5	15L	
Bl Sh Tan h	18.5	10R	

Xenodosh	18.1	18L	
2 AC Wren h	19.2	5L	
Green h	18.8	10R	
YO Flyc h	18.9	8R	11/35
15FL 7L 54 → 0.5-5			
B3 → 0.5-7 → 0.6-5			
610-805 8 APRIL 1972			
Bl Mr Shu Tan h	0.1	6R	8/13 4000
Ch h	0.3	7R	5/10
YBFL S	0.4	00	8/10
Bl Mr Shu Tan h	0.3	17L	
Ch h	0.2	5R	3/5
Bl Mr Shu Tan h	1.1	1R	52/23
YBFL S	1.1	00	32/33
Bl Mr Shu Tan h	0.8	15R	milpa
Bl Mr Shu Tan h	0.9	0.0	10/13
Bl Mr Shu Tan h	1.1	9L	
Bl Mr Shu Tan h	1.2	3L	
3 Bl Mr Shu Tan h		5L	
2 Sp br Wren	1.3	11R	
Bl Mr Shu Tan h	6.8	10L	
Bl Mr Shu Tan h	0.7	10R	
Bl Mr Shu Tan h	1.4	8L	10/12
Bl Mr Shu Tan h	1.3	20L	
Bl Mr Shu Tan h	1.8	11L	
Bl Mr Shu Tan h	"	16R	
Bl Mr Shu Tan h	2.1	11L	
Bl Mr Shu Tan h	2.3	14R	43/22
Bl Mr Shu Tan h	3.3	15L	
Bl Mr Shu Tan h	3.3	15R	
Bl Mr Shu Tan h	3.7	7L	
Bl Mr Shu Tan h	3.8	10R	27/32
Bl Mr Shu Tan h	3.6	11L	
Bl Mr Shu Tan h	3.7	15R	24/26
Bl Mr Shu Tan h	4.7	15R	

2 Sulph bell Flyc s	5	5-8R	12/20
2 w Budytes h	5.3	10R	
B Chc Wreath h	5.7	14R	
3 Orch Oriole ^{1 imm} s	6.2	16R	21/28
LT Hermit s	5.8	11L	
Redst s	6.4	20R	9/12
1 " ood	7.4	10R	9/14
2 M Tityra ^{nest} h	8.1	9L	
No Oriole ood	8.2	6L	20/28
Su A s	8.1	12L	21/28
Rufous t t t t t	8.9	20R	
" " " "	10.4	5R	
M Black h	10.2	16R	15/20
YBFL h	10.7	8R	12/20
BO Manakin h	10.7	6R	
2 " " "	11.3	8L	
CICADAS			
YO Flyc h	11.1	17R	
Red faced Parrot s	13.8	15L	14/21
2 GB Tanager s	14.2	17L	11/13
RC Manakin h	14.8	10R	
LT Hermit LSK h	15.4	18R	
Orange bill Sparrow h	15.7	16R	
Green Parrot h	16.4	20L	
HA Fly h	17.2	10R	
B + M Col Gl h	17.3	7L	0/1

[illegible]

L. Hermit s	4.5	3L	
4 DWA Wren h	4.9	9L	
Orebird h	5.4	3R	1/3
Belted Salt h	6.3	9R	
Wilson s	6.4	13L	10/11
SH Ph h	6.7	6R	
2 " "	7.1	9R	
Variable Seedeater h	7.2	8L	
LR Gnatcatcher h	7.3	12R	
YB Cacique s	7.5	10R	2/4 Can
St. Ind W. Cap h	7.3	13R	
Spot breast h	8.1	7R	
Green Coll Tanager	7.9	20R	
2 R T A Tanager	8.2	10R	
Wilson h	8	6R	
B. Antshrike h	8.2	17R	
GB Sparrow h	8.5	15R	
YB Cacique h	8.5	11R	Can
2 B. Ind Salt h	8.4	10R	9/12
Social Ph h	8.9	14R	
Var Seedeater h	9.2	5R	Can
B. quail h	8.7	15L	
2 D. Ant h	9.4	5R	Can
B. quail	9.4	8R	9/10
Wilson Warb s	9.6	12R	10/11
2 M. Tanager s	"	"	12/13
Belted Salt h	10.1	3L	

S. Wren h	10.3	15L	
2 " " "	9.9	17L	
Gray Salt h s	10.4	10L	10/11
V. Tanager s	10.3	10L	9/10
S. Tanager s	10.5	18L	14/18
2 R. Ph h			
Chained S. Ph h			
B. Ph h			
GB Sparrow h	10.7	20L	
2 B. Antshrike h	11.4	8R	
2 M. Blackbird h	11.5	5R	
GB Sparrow h		20R	
2 S. Ring Tanager			10/13
No Chale h			
2 Wooded ch. g. s. s. s.			
UL. s. s. s. s. s.	11.8	3L	2/2
GB Sparrow h		1R	
2 E. Tanager s	12.5	10L	12/23
S. Ind h		20L	
S. Ring Tanager s	12.8	1L	4/7
3 R. Salt h	13.1	10L	
Wilson s	12.8	5L	4/5
GB Antshrike h	12.7	11L	
Chachalaca s	12.8	1L	2/5
Var Seedeater h	12.7	8R	Can
2 Antshrike	12.7	6L	
GB Sparrow h	13.2	12L	
EBM Salt h	13.2	15L	
2 Variable Seed s. s.	13.2	8L	3/10
2 Prop. Ph h	13.8	15L	
Salt W. Ph h	13.9	12L	
Red B. Ph h	13.6	8R	11/15
Red Ph h	14.3	7L	
2 Red W. Tanager s	14.3	17L	04/05
Wilson s	14.2	16R	
S. Tanager s	14.8	1R	10/11
Wilson s	14.7	1R	11/12
Wilson s	14.7	8R	
Wilson s	"	11R	

Wilson's	S	14.7	HL
WBL	h	14.9	1BR
YO Phich		14.6	2R
21B Caccagnini	h	15.4	2L
21B Gagan	h	15.7	1BR
LB Buchanan	h	16.6	6L
Wilson	h	16.8	1BR
WB Wamp		16.8	5R
2S WTR Phic		16.9	5L
2S WTR Wamp		18.1	17L
Wilson	S	18.3	1R 2L
Van Seiber	h	19.2	AR ¹⁰⁰⁰
B. quit	h	19.4	17 1/2
3 DNA W. an	S	19.8	2L

FOLIAGE HEIGHT PROFILE 20 FOREST CHAIN 91-92

0	+	200	1, 2, 5, 9, 13	50	0.5, 6
	+		0.5, 2, 3		-1, 5, 7, 8, 11, 14
	-2, 3, 10		0.5, 2, 5, 6		-11, 12, 14
	1, 3		0.5, 12		1, 5, 6, 9, 11, 13
	1, 2, 15	8	0.5, 4	50	1, 9, 10
50	0.5, 11		1, 8, 13		-2, 4, 5, 14
	1, 2, 4, 8		+, 9		-2, 6, 9, 11
	-7, 9		1, 2, 7, 8		1, 3, 8
	1, 7, 9		1, 4, 10		+, 10, 12
	0.5, 4	8	1, 3, 4, 10, 12	50	1, 7, 12
100	0.5, 6		1, 2, 3, 6, 9, 10, 14		-1, 2, 7, 8, 13
	0.5, 2, 10		1, 9, 14		0.5, 9, 12
	-10, 11, 22		1, 2, 10, 12		+, 6, 8, 9
	-3, 7, 10, 20		1, 2, 4, 9, 10, 11		0.5, 11, 13
	0.5, 3	8	0.5, 1, 3, 11, 12, 15	50	+, 8, 11
150	0.5, 2		1, 10, 11		+, 4, 9, 21
	0.5, 6		-1, 14		1, 4, 7, 10, 15
	0.5, 7, 13		-2, 9, 11-17		+, 4, 6, 20
	0.5, 3, 4, 11, 17		-2		+, 3, 5, 8
	-2, 3	40	-3, 4, 8, 14	8	1, 3
200	+, 3		1, 5, 8, 27		+, 4, 7, 10, 14
	0.5, 2		+, 13		0.5, 5, 10, 11
	1, 9, 16		0.5, 14		+, 3, 10, 12
	1, 2, 9		1, 2, 4, 10, 18		+, 4, 7, 10
	0.5, 14	8	0.5, 2, 9	50	+, 5, 10
250	1, 3, 4				

(22 points/1100 meters)

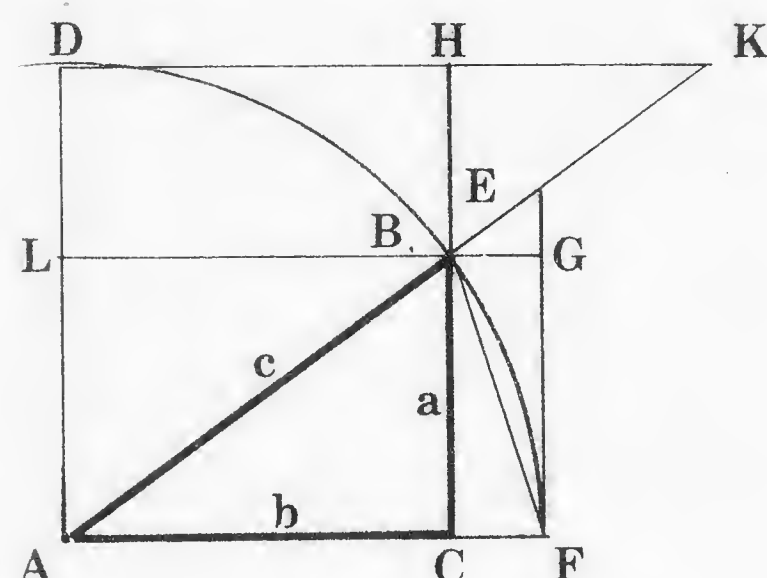
		VINES	G A P S	
760	-1, 2, 8, 15	01 R -	60	-90 meter
	1, 9, 11	L -	50	transsect unit
	+, 5, 9	1-2 R -	15	
	-7, 12	L -	35	
800	+, 4, 5, 9	2-3 R -	30	
	-4, 8, 12	L -	-	
	-2, 8	3-4 R -	10	
	1, 4, 7	L -	35	
	+	4-5 R -	30	
850	-2, 4, 15	L -	40	
	1, 4-6	5-6 R -	-	
	1, 5	L -	10	
	+, 2, 8, 13	6-7 R -	5	
	0.5, 2, 7-10	L -	20	
900	-5, 6, 7	7-8 R -	25	
	-7, 8, 11	L -	25	
	-5, 17	8-9 R -	15	
	-8, 12	L -	5	
	0.5, 13	9-10 R -	50	
950	0.5, 9	L -	5	
	0.5, 7, 12	10-11 R -	50	
	+, 7, 8, 18	L -	-	
	-7, 9	11-12 R -	45	
	0.5, 2, 7-9	L -	-	
1000	1, 8, 9	12-13 R -	-	
	-8, 12, 13	L -	-	
	1, 3, 11, 12	13-14 R -	-	
	1, 14, 15	L -	-	
	+, 8-12	14-15 R -	10	
1050	+, 7, 12, 13	L -	-	
	+, 8, 10-13	15-16 R -	-	
	+, 5, 8	L -	-	
	1, 3, 5, 6, 9	16-17 R -	10	
	-2, 6-8	L -	35	
1100	-3, 7-13	17-18 R -	15	
		L -	-	
		18-19 R -	-	
		L -	5	
		19-20 R -	-	
		L -	5	
		20-21 R -	-	
		L -	40	
		21-22 R -	10	
		L -	40	

FUNCIONES TRIGONOMETRICAS

Sea el ángulo BAC (Fig. 1) = A = arco BF, y el radio AB = AF = AD = 1.

Entonces:

sen	A = BC
cos	A = AC
tg	A = FE
cot	A = DK
sec	A = AE
cosec	A = AK
senver	A = CF
cosvers	A = LD
exsec	A = BE
coexsec	A = BK
cuerda	A = BF



(En el triángulo recto) ABC (Fig. 1), sea el ángulo BAC = A, ABC y ACB = C = 90°. Haga el lado BC = a, AC = b y AB = c.

Entonces tenemos que:

1.-sen	$A = \frac{a}{c}$	= cos	B
2.-sen	$B = \frac{b}{c}$	= cos	A
3.-tg	$A = \frac{a}{b}$	= cot	B
4.-tg	$B = \frac{b}{a}$	= cot	A
5.-sec	$A = \frac{c}{b}$	= cosec	B
6.-sec	$B = \frac{c}{a}$	= cosec	A
7.-senver	$A = \frac{c-b}{c}$	= cosver	B
8.-senver	$B = \frac{c-a}{c}$	= cosver	A
9.-exsec	$A = \frac{c-b}{b}$	= coexsec	B
10.-exsec	$B = \frac{c-a}{a}$	= coexsec	A

$$\begin{aligned}
 11.- a &= c \sin A = c \cos B \\
 &= b \tan A = b \cot B \\
 &= \sqrt{c^2 - b^2} \\
 &= \sqrt{(c + b)(c - b)}
 \end{aligned}$$

$$\begin{aligned}
 12.- b &= c \cos A = c \sin B \\
 &= a \cot A = a \tan B \\
 &= \sqrt{(c + a)(c - a)}
 \end{aligned}$$

$$\begin{aligned}
 13.- c &= \frac{a}{\sin A} = \frac{a}{\cos B} \\
 &= \frac{b}{\cos A} = \frac{b}{\sin B} \\
 &= \sqrt{a^2 + b^2}
 \end{aligned}$$

14. $\sin A = \frac{1}{\operatorname{cosec} A} = \tan A \cos A$; $\therefore \cos A = \frac{1}{\sec A} = \cot A \sin A$
15. $\tan A = \frac{\sin A}{\cos A} = \frac{1}{\cot A}$; $\therefore \cot A = \frac{\cos A}{\sin A} = \frac{1}{\tan A}$
16. $\operatorname{senver} A = 1 - \cos A = \sin A \tan \frac{1}{2} A = 2 \sin^2 \left(\frac{1}{2} A \right)$
17. $\sec A = \frac{1}{\cos A} = \sqrt{1 + \tan^2 A}$; $\therefore \operatorname{cosec} A = \frac{1}{\sin A} = \sqrt{1 + \cot^2 A}$
18. $\operatorname{exsec} A = \sec A - 1 = \frac{\tan A \tan \frac{1}{2} A}{\cos A} = \frac{\operatorname{senver} A}{\cos A}$

FORMULAS DE LA CURVA

Caso 1. Cuando D representa el ángulo correspondiente a una cuerda de 20 m.

$$19. R = \frac{10}{\sin(D/2)}; \therefore \sin(D/2) = \frac{10}{R}$$

Caso 2. Cuando D representa el ángulo correspondiente a dos cuerdas consecutivas de 10 m cada una.

$$20. R = \frac{5}{\sin(D/4)}; \therefore \sin(D/4) = \frac{5}{R}$$

$$21. \text{Longitud de la curva} \quad L = 20 \frac{L}{D} \quad (\text{para } R \gg 100 \text{ mts})$$

$$22. \text{Ángulo intersectado} \quad I = \frac{DL}{20}$$

$$23. \text{Grado de la curva} \quad D = 20 \frac{L}{L}$$

$$24. \text{Tamaño de la tangente} \quad T = R \tan(I/2)$$

$$25. \text{Cuerda del arco} \quad C = 2R \sin(I/2)$$

$$26. \text{Ordenada media} \quad M = R \operatorname{senver}(I/2)$$

$$27. \text{Externa} \quad E = R \operatorname{exsec}(I/2)$$

$$28. \text{Radio} \quad R = T \cot(I/2)$$

$$29. \text{Tangente a la curva de 1 grado} = 1145.9 \tan(I/2)$$

$$30. \text{Externa a la curva de 1 grado} = 1145.9 \operatorname{exsec}(I/2) \\ = T \tan(I/4) = 1145.9 \tan(I/4) \tan(I/2)$$

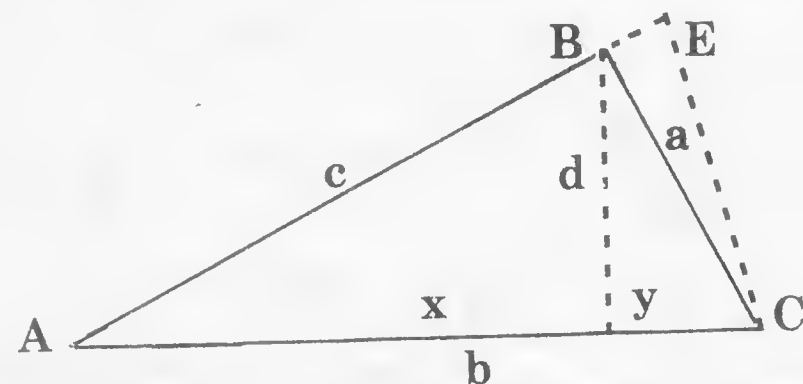
TABLA I

Fórmulas Trigonómicas

SOLUCION DE TRIANGULOS OBLICUOS

Para evitar confusión de símbolos; "A" y "a" representan el ángulo más pequeño y su lado opuesto respectivamente. "B" y "b" los mayores, dejando a "C" y "c" para representar a los intermedios. Sin embargo, este orden no siempre puede ser observado con las fórmulas 34 y 35.

Fig. 2



	DADO	PEDIDO	FORMULAS
31	Dos Ang's	3er Ang.	3er Ang. = 180 - (Suma de los dos ang. dados)
32	A, B, a	b	$b = \frac{a}{\sin A} \sin B$; $\therefore c = \frac{a}{\sin A} \sin C$
	B, C, b	c	$c = \frac{b}{\sin B} \sin C$; $\therefore a = \frac{b}{\sin B} \sin A$
	C, A, c	a	$a = \frac{c}{\sin C} \sin A$; $\therefore b = \frac{c}{\sin C} \sin B$
33	a, b, c	A, C	Considere el lado más largo "b" dividido por la normal "d" en dos segmentos "x" e "y". Si "d" parte de "B" se tiene la siguiente proporción: $\frac{b}{c+a} = \frac{c-a}{x-y}$ $\therefore x-y = \frac{(c+a)(c-a)}{b}$ $\therefore \cos A = \frac{x}{c} \cos C = \frac{y}{a}$ $\cos A = \frac{b^2 + c^2 - a^2}{2bc} \cos C = \frac{b^2 + a^2 - c^2}{2ab}$
34	a, B, c	$\frac{C-A}{2}$	$\operatorname{tg} \frac{C-A}{2} = \frac{c-a}{c+a} \operatorname{tg} \frac{C+A}{2}$
	A, b, c	C, a	$c \cos A = x$; $b-x = y$; $c \sin A = d$ $\therefore \operatorname{tg} C = \frac{d}{y}$; $a = \frac{C}{\sin C}$
35	a, b, A	B, c	$\sin B = \frac{b \sin A}{a}$; $c = \frac{a \sin C}{\sin A}$

Recuerde: Un ángulo y su suplemento tienen el mismo seno. Como B y E Fig. 2

TABLA II

Radios de las curvas métricas

Grados por cadena de 20 m.	Radio de la curva R.	Logaritmo del radio Log. R.	Deflexión por metro d. m.	D.	R.	Log. R.	d. m.
0° 0	6875.5	3.8373 04	0.25	2° 0	572.99	2.7581 45	3.00
12	5729.6	7581 23	0.30	2	563.59	7509 67	3.05
14	4911.1	6911 76	0.35	4	554.51	7439 06	3.10
16	4297.2	6331 84	0.40	6	545.70	7369 58	3.15
18	3819.7	5820 32	0.45	8	537.18	7301 19	3.20
20	3437.8	5362 74	0.50	10	528.92	7233 86	3.25
22	3125.2	4948 82	0.55	12	520.90	7167 57	3.30
24	2864.8	4570 94	0.60	14	513.13	7102 27	3.35
26	2644.4	4223 32	0.65	16	505.58	7037 93	3.40
28	2455.5	3901 47	0.70	18	498.26	6974 54	3.45
30	2291.8	3601 84	0.75	20	491.14	6912 06	3.50
32	2148.6	3321 55	0.80	22	484.22	6850 46	3.55
34	2022.2	3058 27	0.85	24	477.50	6789 73	3.60
36	1909.9	2810 03	0.90	26	470.96	6729 84	3.65
38	1809.3	2575 23	0.95	28	464.60	6670 76	3.70
40	1718.9	2352 46	1.00	30	458.40	6612 47	3.75
42	1637.0	2140 57	1.05	32	452.37	6554 96	3.80
44	1562.6	1938 54	1.10	34	446.50	6498 19	3.85
46	1494.7	1745 49	1.15	36	440.78	6442 17	3.90
48	1432.4	1560 66	1.20	38	435.20	6386 85	3.95
50	1371.1	1383 38	1.25	40	429.76	6332 23	4.00
52	1322.2	1213 05	1.30	42	424.45	6278 29	4.05
54	1273.3	1049 15	1.35	44	419.28	6225 01	4.10
56	1227.8	0891 21	1.40	46	414.23	6172 38	4.15
58	1185.4	0738 81	1.45	48	409.30	6120 38	4.20
1° 0	1145.9	0591 58	1.50	50	404.48	6068 99	4.25
2	1109.0	0449 18	1.55	52	399.78	6018 21	4.30
4	1074.3	0311 30	1.60	54	395.19	5968 01	4.35
6	1041.8	0177 67	1.65	56	390.70	5918 39	4.40
8	1011.1	0048 02	1.70	58	386.31	5869 32	4.45
10	982.23	2.9922 13	1.75	3° 0'	382.02	5820 81	4.50
12	954.95	9799 79	1.80	2	377.82	5772 83	4.55
14	929.14	9680 81	1.85	4	373.71	5725 38	4.60
16	904.69	9564 99	1.90	6	369.70	5678 44	4.65
18	881.49	9452 19	1.95	8	365.76	5632 00	4.70
20	859.46	9342 24	2.00	10	361.91	5586 06	4.75
22	838.49	9235 00	2.05	12	358.15	5540 59	4.80
24	818.53	9130 35	2.10	14	354.45	5495 60	4.85
26	799.50	9028 17	2.15	16	350.84	5451 07	4.90
28	781.33	8928 33	2.20	18	347.30	5406 99	4.95
30	763.97	8830 74	2.25	20	343.82	5363 35	5.00
32	747.36	8735 29	2.30	22	340.42	5320 15	5.05
34	731.46	8641 90	2.35	24	337.08	5277 37	5.10
36	716.22	8550 47	2.40	26	333.81	5235 02	5.15
38	701.60	8460 93	2.45	28	330.60	5193 07	5.20
40	687.57	8373 19	2.50	30	327.46	5151 52	5.25
42	674.09	8287 20	2.55	32	324.37	5110 37	5.30
44	661.13	8202 87	2.60	34	321.34	5069 60	5.35
46	648.66	8120 15	2.65	36	318.36	5029 22	5.40
48	636.65	8038 98	2.70	38	315.44	4989 20	5.45
50	625.07	7959 30	2.75	40	312.58	4949 55	5.50
52	613.91	7881 05	2.80	42	309.76	4910 26	5.55
54	603.14	7804 19	2.85	44	307.00	4871 33	5.60
56	592.74	7728 66	2.90	46	304.28	4832 74	5.65
58	582.70	7654 43	2.95	48	301.61	4794 49	5.70
				50	298.99	4756 57	5.75
				52	296.41	4718 98	5.80
				54	293.88	4681 72	5.85
				56	291.39	4644 77	5.90
				58	288.94	4608 14	5.95

TABLA II Radios de las curvas métricas

D.	R.	Log. R.	d. m.	D.	R.	Log. R.	d. m.
4° 0'	286.54	2. 4571 81	6.00'	6° 0'	191.07	2. 2812 00	9.00'
2	284.17	4535 78	6.05	2	190.02	2787 96	9.05
4	281.84	4500 05	6.10	4	188.98	2764 05	9.10
6	279.55	4464 61	6.15	6	187.94	2740 28	9.15
8	277.30	4429 46	6.20	8	186.92	2716 63	9.20
10	275.08	4394 60	6.25	10	185.91	2693 12	9.25
12	272.90	4360 01	6.30	12	184.92	2669 73	9.30
14	270.75	4325 69	6.35	14	183.93	2646 46	9.35
16	268.64	4291 64	6.40	16	182.95	2623 33	9.40
18	266.55	4257 86	6.45	18	181.98	2600 31	9.45
20	264.51	4224 34	6.50	20	181.03	2577 41	9.50
22	262.49	4191 08	6.55	22	180.08	2554 64	9.55
24	260.50	4158 07	6.60	24	179.14	2531 98	9.60
26	258.54	4125 31	6.65	26	178.22	2509 45	9.65
28	256.61	4092 79	6.70	28	177.30	2487 03	9.70
30	254.71	4060 52	6.75	30	176.39	2464 72	9.75
32	252.84	4028 48	6.80	32	175.49	2442 53	9.80
34	251.00	3996 68	6.85	34	174.60	2420 45	9.85
36	249.18	3965 11	6.90	36	173.72	2398 49	9.90
38	247.39	3933 77	6.95	38	172.85	2376 63	9.95
40	245.62	3902 66	7.00	40	171.98	2354 89	10.00
42	243.88	3871 77	7.05	42	171.13	2333 25	10.05
44	242.16	3841 09	7.10	44	170.28	2311 72	10.10
46	240.47	3810 63	7.15	46	169.45	2290 30	10.15
48	238.80	3780 38	7.20	48	168.62	2268 99	10.20
50	237.16	3750 35	7.25	50	167.79	2247 77	10.25
52	235.53	3720 52	7.30	52	166.98	2226 67	10.30
54	233.93	3690 89	7.35	54	166.18	2205 66	10.35
56	232.35	3661 46	7.40	56	165.38	2184 76	10.40
58	230.70	3632 24	7.45	58	164.59	2163 95	10.45
5° 0'	229.26	3603 20	7.50	7° 0'	163.80	2143 25	10.50
2	227.74	3574 37	7.55	2	163.03	2122 64	10.55
4	226.24	3545 72	7.60	4	162.26	2102 13	10.60
6	224.76	3517 26	7.65	6	161.50	2081 72	10.65
8	223.30	3488 98	7.70	8	160.75	2061 41	10.70
10	221.87	3460 89	7.75	10	160.00	2041 19	10.75
12	220.44	3432 98	7.80	12	159.26	2021 06	10.80
14	219.04	3405 25	7.85	14	158.53	2001 03	10.85
16	217.66	3377 70	7.90	16	157.80	1981 08	10.90
18	216.29	3350 32	7.95	18	157.08	1961 24	10.95
20	214.94	3323 11	8.00	20	156.37	1941 48	11.00
22	213.60	3296 07	8.05	22	155.66	1921 81	11.05
24	212.29	3269 20	8.10	24	154.96	1902 23	11.10
26	210.98	3242 49	8.15	26	154.27	1882 74	11.15
28	209.70	3215 95	8.20	28	153.58	1863 33	11.20
30	208.43	3189 57	8.25	30	152.90	1844 01	11.25
32	207.17	3163 35	8.30	32	152.22	1824 78	11.30
34	205.93	3137 28	8.35	34	151.55	1805 64	11.35
36	204.71	3111 37	8.40	36	150.89	1786 57	11.40
38	203.50	3085 62	8.45	38	150.23	1767 60	11.45
40	202.30	3060 02	8.50	40	149.58	1748 70	11.50
42	201.12	3034 57	8.55	42	148.93	1729 89	11.55
44	199.95	3009 27	8.60	44	148.29	1711 16	11.60
46	198.80	2984 11	8.65	46	147.66	1692 51	11.65
48	197.66	2959 10	8.70	48	147.03	1673 93	11.70
50	196.53	2934 23	8.75	50	146.40	1655 44	11.75
52	195.41	2909 51	8.80	52	145.78	1637 03	11.80
54	194.31	2884 93	8.85	54	145.17	1618 70	11.85
56	193.22	2860 48	8.90	56	144.56	1600 44	11.90
58	192.14	2836 17	8.95	58	143.95	1582 26	11.95

TABLA II Radios de las curvas métricas

D.	R.	Log. R.	d. m.	D.	R.	Log. R.	d. m.
8° 0'	143.36	2. 1564 15	12.00	10° 0'	114.74	2. 0597 04	15.00
2	142.76	1546 13	12.05	2	114.36	0582 62	15.05
4	142.17	1528 17	12.10	4	113.98	0568 26	15.10
6	141.59	1510 29	12.15	6	113.60	0553 94	15.15
8	141.01	1492 49	12.20	8	113.23	0539 67	15.20
10	140.44	1474 75	12.25	10	112.86	0525 44	15.25
12	139.87	1457 09	12.30	12	112.49	0511 26	15.30
14	139.30	1439 51	12.35	14	112.13	0497 13	15.35
16	138.74	1421 99	12.40	16	111.76	0483 04	15.40
18	138.18	1404 54	12.45	18	111.40	0469 00	15.45
20	137.63	1387 17	12.50	20	111.05	0455 01	15.50
22	137.08	1369 86	12.55	22	110.69	0441 06	15.55
24	136.54	1352 62	12.60	24	110.34	0427 16	15.60
26	136.00	1335 45	12.65	26	109.98	0413 30	15.65
28	135.47	1318 35	12.70	28	109.63	0399 48	15.70
30	134.94	1301 32	12.75	30	109.29	0385 71	15.75
32	134.41	1284 35	12.80	32	108.94	0371 99	15.80
34	133.89	1267 45	12.85	34	108.60	0358 30	15.85
36	133.37	1250 62	12.90	36	108.26	0344 66	15.90
38	132.86	1233 85	12.95	38	107.92	0331 07	15.95
40	132.35	1217 15	13.00	40	107.58	0317 51	16.00
42	131.84	1200 51	13.05	42	107.25	0304 00	16.05
44	131.34	1183 93	13.10	44	106.92	0290 53	16.10
46	130.84	1167 42	13.15	46	106.59	0277 11	16.15
48	130.35	1150 97	13.20	48	106.26	0263 72	16.20
50	129.85	1134 58	13.25	50	105.93	0250 38	16.25
52	129.37	1118 26	13.30	52	105.61	0237 07	16.30
54	128.88	1101 99	13.35	54	105.29	0223 81	16.35
56	128.40	1085 79	13.40	56	104.97	0210 59	16.40
58	127.93	1069 65	13.45	58	104.65	0197 41	16.45
9° 0'	127.45	1053 57	13.50	11° 0'	104.33	0184 27	16.50
2	126.99	1037 54	13.55	2	104.02	0171 17	16.55
4	126.52	1021 58	13.60	4	103.71	0158 11	16.60
6	126.06	1005 68	13.65	6	103.40	0145 09	16.65
8	125.60	0989 83	13.70	8	103.09	0132 11	16.70
10	125.14	0974 04	13.75	10	102.78	0119 17	16.75
12	124.69	0958 31	13.80	12	102.48	0106 26	16.80
14	124.24	0942 64	13.85	14	102.17	0093 40	16.85
16	123.79	0927 03	13.90	16	101.87	0080 57	16.90
18	123.35	0911 47	13.95	18	101.57	0067 78	16.95
20	122.91	0895 96	14.00	20	101.28	0055 03	17.00
22	122.48	0890 51	14.05	22	100.98	0042 32	17.05
24	122.04	0865 12	14.10	24	100.68	0029 64	17.10
26	121.61	0849 78	14.15	26	100.39	0017 01	17.15
28	121.19	0834 50	14.20	28	100.10	0004 40	17.20
30	120.76	0819 27	14.25	30	99.69	1. 9986 37	17.25
32	120.34	0804 09	14.30	32	99.40	9973 81	17.30
34	119.92	0788 97	14.35	34	99.11	9961 29	17.35
36	119.51	0773 90	14.40	36	98.83	9948 80	17.40
38	119.09	0758 88	14.45	38	98.55	9936 35	17.45
40	118.68	0743 91	14.50	40	98.26	9923 93	17.50
42	118.28	0729 00	14.55	42	97.98	9911 55	17.55
44	117.87	0714 13	14.60	44	97.71	9899 21	17.60
46	117.47	0699 32	14.65	46	97.43	9886 90	17.65
48	117.07	0684 56	14.70	48	97.15	9874 63	17.70
50	116.68	0669 85	14.75	50	96.88	9862 38	17.75
52	116.28	0655 19	14.80	52	96.61	9850 18	17.80
54	115.89	0640 58	14.85	54	96.34	9838 01	17.85
56	115.51	0626 02	14.90	56	96.07	9825 87	17.90
58	115.12	0611 50	14.95	58	95.80	9813 77	17.95

* Curvas de menos de 100 m de radio deben localizarse por medias cadenas o cuerdas de 10 m

TABLA II

Radios de las curvas métricas

D.	R.	Log. R.	d. m.	D.	R.	Log. R.	d. m.
12° 0'	95.54	1. 9801 70	18.00'	14° 0'	81.90	1. 9132 95	21.00
2	95.27	9789 66	18.05	10	80.94	9081 62	21.25
4	95.01	9777 66	18.10	20	80.00	9030 89	21.50
6	94.75	9765 69	18.15	30	79.08	8980 74	21.75
8	94.49	9753 75	18.20	40	78.18	8931 18	22.00
10	94.23	9741 85	18.25	50	77.31	8882 17	22.25
12	93.97	9729 98	18.30	15° 0'	76.45	8833 71	22.50
14	93.72	9718 14	18.35	10	75.61	8785 80	22.75
16	93.46	9706 33	18.40	20	74.79	8738 40	23.00
18	93.21	9694 56	18.45	30	73.99	8691 52	23.25
				40	73.20	8645 14	23.50
				50	72.43	8599 26	23.75
20	92.96	9682 82	18.50				
22	92.71	9671 11	18.55	16° 0'	71.68	8553 85	24.00
24	92.46	9659 43	18.60	10	70.94	8508 92	24.25
24	92.21	9647 78	18.65	20	70.22	8464 45	24.50
28	91.96	9636 16	18.70	30	69.51	8420 44	24.75
30	91.72	9624 58	18.75	40	68.82	8376 87	25.00
32	91.47	9613 03	18.80	50	68.14	8333 73	25.25
34	91.23	9601 50	18.85	17° 0'	67.47	8291 02	25.50
36	90.99	9590 01	18.90	10	66.81	8248 73	25.75
38	90.75	9578 55	18.95	20	66.17	8206 85	26.00
				30	65.54	8165 37	26.25
40	90.51	9567 11	19.00	40	64.93	8124 28	26.50
42	90.28	9555 71	19.05	50	64.32	8083 58	26.75
44	90.04	9544 34	19.10				
46	89.80	9533 00	19.15	18° 0'	63.73	8043 27	27.00
48	89.57	9521 68	19.20	10	63.14	8003 32	27.25
50	89.34	9510 40	19.25	20	62.57	7963 74	27.50
52	89.11	9499 15	19.30	30	62.01	7924 53	27.75
54	88.88	9487 92	19.35	40	61.46	7885 66	28.00
56	88.65	9476 73	19.40	50	60.91	7847 14	28.25
58	88.42	9465 56	19.45	19° 0'	60.38	7808 97	28.50
				10	59.86	7771 12	28.75
13° 0'	88.19	9454 42	19.50	20	59.34	7733 61	29.00
2	87.97	9443 31	19.55	30	58.84	7696 42	29.25
4	87.75	9432 23	19.60	40	58.34	7659 55	29.50
6	87.52	9421 18	19.65	50	57.85	7622 99	29.75
8	87.30	9410 15	19.70				
10	87.08	9399 16	19.75	20° 0'	57.37	7586 74	30.00
12	86.86	9388 19	19.80	10	56.90	7550 79	30.25
14	86.64	9377 25	19.85	20	56.43	7515 14	30.50
16	86.42	9366 33	19.90	30	55.97	7479 78	30.75
18	86.21	9355 45	19.95	40	55.52	7444 71	31.00
				50	55.08	7409 92	31.25
20	85.99	9344 59	20.00	21° 0'	54.64	7375 41	31.50
22	85.78	9333 76	20.05	10	54.21	7341 18	31.75
24	85.56	9322 95	20.10	20	53.79	7307 21	32.00
26	85.35	9312 18	20.15	30	53.38	7278 51	32.25
28	85.14	9301 42	20.20	40	52.97	7240 08	32.50
30	84.93	9290 70	20.25	50	52.56	7206 90	32.75
32	84.72	9280 00	20.30	22° 0'	52.17	7173 97	33.00
34	84.51	9269 33	20.35	10	51.78	7141 30	33.25
36	84.31	9258 69	20.40	20	51.39	7108 87	33.50
38	84.10	9248 07	20.45				
				30	51.01	7076 68	33.75
40	83.90	9237 47	20.50	40	50.64	7044 73	34.00
42	83.69	9226 91	20.55	50	50.27	7013 02	34.25
44	83.49	9216 37	20.60	23° 0'	49.91	6981 54	34.50
46	83.29	9205 85	20.65	10	49.55	6950 29	34.75
48	83.09	9195 36	20.70	20	49.20	6919 26	35.00
50	82.89	9184 89	20.75	30	48.85	6888 46	35.25
52	82.69	9174 46	20.80	40	48.51	6857 88	35.50
54	82.49	9164 04	20.85	50	48.17	6827 51	35.75
56	82.29	9153 65	20.90	24° 0'	47.83	6797 35	36.00
58	82.10	9143 29	20.95				

* Curvas de menos de 100 m de radio deben localizarse por medias cadenas o cuerdas de 10 m

TABLA III

Tangentes y externas a curvas de grado 1

Angulo	Tang.	Externa	Angulo	Tang.	Externa	Angulo	Tang.	Externa
1°	10.00	.044	11°	110.3	5.30	21°	212.4	19.52
10	11.67	.059	10'	112.0	5.46	10'	214.1	19.83
20	13.33	.078	20	113.7	5.63	20	215.8	20.15
30	15.00	.098	30	115.4	5.79	30	217.6	20.47
40	16.67	.121	40	117.1	5.96	40	219.3	20.79
50	18.34	.147	50	118.8	6.14	50	221.0	21.12
2	20.00	.175	12	120.4	6.31	22	222.7	21.45
10	21.67	.205	10	122.1	6.49	10	224.5	21.78
20	23.34	.238	20	123.8	6.67	20	226.2	22.11
30	25.00	.273	30	125.5	6.85	30	227.9	22.45
40	26.67	.310	40	127.2	7.04	40	229.7	22.79
50	28.34	.350	50	128.9	7.22	50	231.4	23.13
3	30.01	.393	13	130.6	7.41	23	233.1	23.48
10	31.68	.438	10	132.2	7.61	10	234.9	23.82
20	33.34	.485	20	133.9	7.80	20	236.6	24.17
30	35.01	.535	30	135.6	8.00	30	238.4	24.53
40	36.68	.587	40	137.3	8.20	40	240.1	24.88
50	38.35	.641	50	139.0	8.40	50	241.8	25.24
4	40.02	.698	14	140.7	8.61	24	243.6	25.60
10	41.69	.758	10	142.4	8.81	10	245.3	25.96
20	43.35	.820	20	144.1	9.02	20	247.1	26.33
30	45.02	.884	30	145.8	9.23	30	248.8	26.70
40	46.69	.951	40	147.5	9.45	40	250.6	27.07
50	48.36	1.02	50	149.2	9.67	50	252.3	27.45
5	50.03	1.09	15	150.9	8.89	25	254.0	27.82
10	51.70	1.17	10	152.6	10.11	10	255.8	28.20
20	53.37	1.24	20	154.3	10.34	20	257.5	28.59
30	55.04	1.32	30	155.9	10.56	30	259.3	28.97
40	56.71	1.40	40	157.6	10.79	40	261.1	29.36
50	58.38	1.49	50	159.3	11.03	50	262.8	29.75
6	60.06	1.57	16	161.0	11.26	26	264.6	30.14
10	61.73	1.66	10	162.7	11.50	10	266.3	30.54
20	63.40	1.75	20	164.4	11.74	20	268.1	30.94
30	65.07	1.85	30	166.1	11.98	30	269.8	31.34
40	66.74	1.94	40	167.8	12.23	40	271.6	31.74
50	68.42	2.04	50	169.6	12.48	50	273.4	32.15
7	70.09	2.14	17	171.3	12.73	27	275.1	32.56
10	71.76	2.24	10	173.0	12.98	10	276.9	32.97
20	73.43	2.35	20	174.7	13.24	20	278.6	33.39
30	75.11	2.46	30	176.4	13.49	30	280.4	33.81
40	76.78	2.57	40	178.1	13.75	40	282.2	34.23
50	78.46	2.68	50	179.8	14.02	50	283.9	34.65
8	80.13	2.80	18	181.5	14.28	28	285.7	35.08
10	81.81	2.92	10	183.2	14.55	10	287.5	35.51
20	83.48	3.04	20	184.9	14.82	20	289.3	35.94
30	85.16	3.16	30	186.6	15.10	30	291.0	36.38
40	86.83	3.29	40	188.3	15.37	40	292.8	36.82
50	88.51	3.41	50	190.0	15.65	50	294.6	37.26
9	90.19	3.54	19	191.8	15.93	29	296.4	37.70
10	91.86	3.68	10	193.5	16.22	10	298.1	38.15
20	93.54	3.81	20	195.2	16.50	20	299.9	38.60
30	95.22	3.95	30	196.9	16.79	30	301.7	39.05
40	96.90	4.09	40	198.6	17.09	40	303.5	39.51
50	98.58	4.23	50	200.3	17.38	50	305.3	39.96
10	100.3	4.38	20	202.1	17.68	30	307.1	40.42
10	101.9	4.52	10	203.8	17.98	10	308.8	40.89
20	103.6	4.67	20	205.5	18.28	20	310.6	41.35
30	105.3	4.83	30	207.2	18.58	30	312.4	41.82
40	107.0	4.98	40	208.9	18.89	40	314.2	42.30
50	108.7	5.14	50	210.7	19.20	50	316.0	42.77

TABLA III

Tangentes y externas a curvas de grado 1

Angulo	Tang.	Externa	Angulo	Tang.	Externa	Angulo	Tang.	Externa
31°	317.8	43.25	41°	428.4	77.48	51°	546.6	123.7
10'	319.6	43.73	10'	430.3	78.14	10'	548.6	124.6
20	321.4	44.22	20	432.2	78.80	20	550.7	125.4
30	323.2	44.70	30	434.2	79.49	30	552.7	126.3
40	325.0	45.19	40	436.1	80.16	40	554.8	127.2
50	326.8	45.68	50	438.0	80.84	50	556.8	128.1
32	328.6	46.18	42	439.9	81.53	52	558.9	129.0
10	330.4	46.68	10	441.8	82.21	10	561.0	129.9
20	332.2	47.18	20	443.7	82.90	20	563.0	130.8
30	334.0	47.69	30	445.6	83.60	30	565.1	131.8
40	335.8	48.19	40	447.5	84.30	40	567.2	132.7
50	337.6	48.70	50	449.5	85.00	50	569.3	133.6
33	339.4	49.22	43	451.4	85.70	53	571.3	134.5
10	341.3	49.73	10	453.3	86.11	10	573.4	135.5
20	343.1	50.25	20	455.2	87.12	20	575.5	136.4
30	344.9	50.77	30	457.2	87.83	30	577.6	137.3
40	346.7	51.30	40	459.1	88.55	40	579.7	138.3
50	348.5	51.83	50	461.0	89.27	50	581.8	139.2
34	350.3	52.36	44	463.0	90.00	54	583.9	140.2
10	352.2	52.89	10	464.9	90.72	10	586.0	141.1
20	354.0	53.43	20	466.9	91.45	20	588.1	142.1
30	355.8	53.97	30	468.8	92.19	30	590.2	143.1
40	357.6	54.52	40	470.8	92.93	40	592.3	144.0
50	359.5	55.06	50	472.7	93.67	50	594.4	145.0
35	361.3	55.61	45	474.7	94.42	55	596.5	146.0
10	363.1	56.16	10	476.6	95.16	10	598.7	146.9
20	365.0	56.72	20	478.6	95.92	20	600.8	147.9
30	366.8	57.28	30	480.5	96.67	30	602.9	148.9
40	368.7	57.84	40	482.5	97.43	10	605.0	149.9
50	370.5	58.40	50	484.5	98.20	50	607.2	150.9
36	372.3	58.97	46	486.4	98.96	56	609.3	151.9
10	374.2	59.54	10	488.4	99.73	10	611.4	152.9
20	376.0	60.12	20	490.4	100.5	20	613.6	153.9
30	377.9	60.69	30	492.3	101.3	30	615.7	154.9
40	379.7	61.27	40	494.3	102.1	40	617.9	156.0
50	381.6	61.86	50	496.3	102.8	50	620.0	157.0
37	383.4	62.44	47	498.3	103.6	57	622.2	158.0
10	385.3	63.03	10	500.2	104.4	10	624.3	159.0
20	387.1	63.63	20	502.2	105.2	20	626.5	160.1
30	389.0	64.22	30	504.2	106.0	30	628.7	161.1
40	390.9	64.82	40	506.2	106.8	40	630.8	162.2
50	392.7	65.42	50	508.2	107.6	50	633.0	163.2
38	394.6	66.03	48	510.2	108.4	58	635.2	164.3
10	396.4	66.64	10	512.2	109.3	10	637.4	165.3
20	398.3	67.25	20	514.2	110.1	20	639.6	166.4
30	400.2	67.86	30	516.2	110.9	30	641.8	167.5
40	402.0	68.48	40	518.2	111.7	40	643.9	168.5
50	403.9	69.10	50	520.2	112.5	50	646.1	169.6
39	405.8	69.73	49	522.2	113.4	59	648.3	170.7
10	407.7	70.36	10	524.2	114.2	10	650.5	171.8
20	409.6	70.99	20	526.3	115.1	20	652.7	172.9
30	411.4	71.62	30	528.3	115.9	30	655.0	174.0
40	413.3	72.26	40	530.3	116.8	40	657.2	175.1
50	415.2	72.90	50	532.3	117.6	50	659.4	176.2
40	417.1	73.54	50	534.4	118.5	60	661.6	177.3
10	419.0	74.19	10	536.4	119.3	10	663.8	178.4
20	420.9	74.84	20	538.4	120.2	20	666.1	179.5
30	422.8	75.49	30	540.5	121.0	30	668.3	180.6
40	424.7	76.15	40	542.5	121.9	40	670.5	181.8
50	426.5	76.81	50	544.5	122.8	50	672.8	182.9

TABLA III

Tangentes y externas a curvas de grado 1

Angulo	Tang.	Externa	Angulo	Tang.	Externa	Angulo	Tang.	Externa
61°	675.0	184.0	71°	817.4	261.6	81°	978.7	361.1
10'	677.3	185.2	10'	819.9	263.1	10'	981.6	362.9
20	679.5	186.3	20	822.4	264.6	20	984.5	364.8
30	681.8	187.5	30	825.0	266.1	30	987.4	366.7
40	684.0	188.6	40	827.5	267.5	40	990.3	368.6
50	686.3	189.8	50	830.0	269.0	50	993.5	370.5
62	688.5	190.9	72	832.6	270.5	82	996.1	372.4
10	690.8	192.1	10	835.1	272.0	10	999.1	374.4
20	693.1	193.3	20	837.7	273.5	20	1002.0	376.3
30	695.4	194.5	30	840.2	275.0	30	1005.0	378.2
40	697.7	195.7	40	842.8	276.6	40	1007.9	380.2
50	699.9	196.9	50	845.4	278.1	50	1010.9	382.1
63	702.2	198.0	73	847.9	279.6	83	1013.8	384.1
10	704.5	199.3	10	850.5	281.1	10	1016.8	386.1
20	706.8	200.5	20	853.1	282.7	20	1019.8	388.1
30	709.1	201.7	30	855.7	284.2	30	1022.8	390.1
40	711.4	202.9	40	858.3	285.8	40	1025.8	392.0
50	713.7	204.1	50	860.9	287.4	50	1028.8	394.1
64	716.1	205.3	74	863.5	288.9	84	1031.8	396.1
10	718.4	206.6	10	866.1	290.5	10	1034.8	398.1
20	720.7	207.8	20	868.8	292.1	20	1037.9	400.1
30	723.0	209.0	30	871.4	293.7	30	1040.9	402.2
40	725.4	210.3	40	874.0	295.3	40	1043.9	404.2
50	727.7	211.5	50	876.7	296.9	50	1047.0	406.3
65	730.0	212.8	75	879.3	298.5	85	1050.1	408.3
10	732.4	214.0	10	882.0	300.1	10	1053.1	410.4
20	734.7	215.3	20	884.6	301.7	20	1056.2	412.5
30	737.1	216.6	30	887.3	303.3	30	1059.3	414.6
40	739.4	217.9	40	889.9	305.0	40	1062.4	416.7
50	741.8	219.1	50	892.6	306.6	50	1065.5	418.8
66	744.2	220.4	76	895.3	308.3	86	1068.6	420.9
10	746.5	221.7	10	898.0	309.9	10	1071.7	423.1
20	748.9	223.0	20	900.7	311.6	20	1074.8	425.2
30	751.3	224.3	30	903.4	313.3	30	1078.0	427.3
40	753.7	225.6	40	906.1	314.9	40	1081.1	429.5
50	756.1	227.0	50	908.8	317.6	50	1084.3	431.7
67	758.5	228.3	77	911.5	318.3	87	1087.4	433.8
10	760.9	229.6	10	914.2	320.0	10	1090.6	436.0
20	763.3	230.9	20	917.0	321.7	20	1093.8	438.2
30	765.7	232.3	30	919.7	323.4	30	1097.0	440.4
40	768.1	233.6	40	922.4	325.1	40	1100.2	442.6
50	770.5	235.0	50	925.2	326.9	50	1103.4	444.9
68	772.9	236.3	78	928.0	328.6	88	1106.6	447.1
10	775.4	237.7	10	930.7	330.3	10	1109.8	449.3
20	777.8	239.0	20	933.5	332.1	20	1113.1	451.6
30	780.2	240.4	30	936.3	333.8	30	1116.3	453.9
40	782.7	241.8	40	939.0	335.6	40	1119.6	456.1
50	785.1	243.2	50	941.8	337.4	50	1123.8	458.4
69	787.6	244.5	79	944.6	339.2	89	1126.1	460.7
10	790.0	245.9	10	947.4	340.9	10	1129.4	463.0
20	792.5	247.3	20	950.2	342.7	20	1132.7	465.3
30	795.0	248.7	30	953.1	344.5	30	1136.0	467.6
40	797.4	250.2	40	955.9	346.3	40	1139.3	470.0
50	799.9	251.6	50	958.7	348.2	50	1142.6	472.3
70	802.4	253.0	80	961.5	350.0	90	1145.9	474.7
10	804.9	254.4	10	964.4	351.8	10	1149.3	477.0
20	807.4	255.9	20	967.2	353.6	20	1152.6	479.4
30	809.9	257.3	30	970.1	355.5	30	1156.0	481.8
40	812.4	258.7	40	973.0	357.3	40	1159.3	484.2
50	814.9	260.2	50	975.8	359.2	50	1162.7	486.6

TABLA III

Tangentes y externas a curvas de grado 1

Angulo	Tang.	Externa	Angulo	Tang.	Externa	Angulo	Tang.	Externa
91°	1166.1	489.0	101°	1390.1	655.6	111°	1667.3	877.2
10'	1169.5	491.4	10'	1394.3	658.8	10'	1672.5	881.5
20	1172.9	493.9	20	1398.4	662.0	20	1677.8	885.8
30	1176.3	496.3	30	1402.5	665.2	30	1683.0	890.2
40	1179.8	498.8	40	1406.7	668.5	40	1688.3	894.5
50	1183.2	501.2	50	1410.9	671.7	50	1693.6	898.9
92	1186.6	503.7	102	1415.1	675.0	112	1698.9	903.3
10	1190.1	506.2	10	1419.3	678.2	10	1704.3	907.8
20	1193.6	508.7	20	1423.6	681.5	20	1709.6	912.2
30	1197.1	511.2	30	1427.8	684.9	30	1715.0	916.7
40	1200.5	513.7	40	1432.1	688.2	40	1720.4	921.2
50	1204.0	516.3	50	1436.3	691.5	50	1725.9	925.7
93	1207.6	518.8	103	1440.6	694.9	113	1731.3	930.8
10	1211.1	521.4	10	1444.9	698.3	10	1736.8	934.8
20	1214.6	523.9	20	1449.3	701.6	20	1742.3	939.4
30	1218.2	526.5	30	1453.6	705.0	30	1747.8	944.1
40	1221.7	529.1	40	1458.0	708.5	40	1753.4	948.7
50	1225.3	531.7	50	1462.3	711.9	50	1759.0	953.4
94	1228.9	534.3	104	1466.7	715.4	114	1764.6	958.1
10	1232.4	536.9	10	1471.1	718.8	10	1770.2	962.8
20	1236.0	539.6	20	1475.6	722.3	20	1775.9	967.6
30	1239.7	542.2	30	1480.0	725.8	30	1781.5	972.3
40	1243.3	544.9	40	1484.4	729.4	40	1787.3	977.1
50	1246.9	547.6	50	1488.9	732.9	50	1793.0	982.0
95	1250.6	550.3	105	1493.4	736.5	115	1798.8	986.8
10	1254.2	553.0	10	1497.9	740.0	10	1804.5	991.7
20	1257.9	555.7	20	1502.4	743.6	20	1810.3	996.6
30	1261.6	558.4	30	1507.0	747.2	30	1816.2	1001.6
40	1265.3	561.1	40	1511.5	750.9	40	1822.1	1006.5
50	1269.0	563.9	50	1516.1	754.5	50	1828.0	1011.5
96	1272.7	566.6	106	1520.7	758.2	116	1833.9	1016.5
10	1276.4	569.4	10	1525.3	761.9	10	1839.8	1021.6
20	1280.1	572.2	20	1529.9	765.6	20	1845.8	1026.7
30	1283.9	575.0	30	1534.6	769.3	30	1851.8	1031.8
40	1287.7	577.8	40	1539.3	773.0	40	1857.8	1036.9
50	1291.5	580.6	50	1543.9	776.8	50	1863.9	1042.1
97	1295.2	583.5	107	1548.6	780.6	117	1870.0	1047.2
10	1299.0	586.3	10	1553.4	784.1	10	1876.1	1052.5
20	1302.9	589.2	20	1558.1	788.2	20	1882.3	1057.7
30	1306.7	592.1	30	1562.9	792.0	30	1888.4	1063.0
40	1310.5	594.9	40	1567.6	795.9	40	1894.6	1068.3
50	1314.4	597.8	50	1572.4	799.7	50	1900.9	1073.6
98	1318.2	600.8	108	1577.2	803.6	118	1907.1	1079.0
10	1322.1	603.7	10	1582.1	807.6	10	1913.4	1084.4
20	1326.0	606.6	20	1586.9	811.5	20	1919.8	1089.8
30	1329.9	609.6	30	1591.8	815.4	30	1926.1	1095.3
40	1333.8	612.6	40	1596.7	819.4	40	1932.5	1100.8
50	1337.8	615.5	50	1601.6	823.4	50	1938.9	1106.3
99	1341.7	618.5	109	1606.5	827.4	119	1945.4	1111.9
10	1345.7	621.5	10	1611.5	831.5	10	1951.9	1117.5
20	1349.6	624.6	20	1616.5	835.5	20	1958.4	1123.1
30	1353.6	627.6	30	1621.6	839.6	30	1965.0	1128.8
40	1357.6	630.7	40	1626.5	843.7	40	1971.5	1134.5
50	1361.6	633.7	50	1631.5	847.8	50	1978.2	1140.2
100	1365.7	636.8	110	1636.6	851.9	120	1984.8	1145.9
10	1369.7	639.9	10	1641.6	856.1	10	1991.5	1151.7
20	1373.8	643.0	20	1646.7	860.3	20	1998.2	1157.5
30	1377.8	646.2	30	1651.9	864.5	30	2005.0	1163.4
40	1381.9	649.3	40	1657.0	868.7	40	2011.8	1169.3
50	1386.0	652.5	50	1662.2	873.0	50	2018.6	1175.2

TABLA III

Tangentes y externas a curvas de grado 1

Angulo	Tang.	Externa	Angulo	Tang.	Externa	Angulo	Tang.	Externa
121°	2025.4	1181.2	125°	2201.3	1335.8	129°	2402.5	1515.9
10'	2032.3	1187.2	10'	2209.2	1342.7	10'	2411.5	1524.0
20	2039.2	1193.2	20	2217.0	1349.7	20	2420.6	1532.2
30	2046.2	1199.3	30	2225.0	1356.8	30	2429.7	1540.5
40	2053.2	1205.4	40	2232.9	1363.9	40	2438.9	1548.8
50	2060.2	1211.6	50	2241.0	1371.0	50	2448.2	1557.1
122	2067.3	1217.7	126	2249.0	1378.2	130	2457.5	1565.6
10	2074.4	1224.0	10	2257.1	1385.4	10	2466.8	1574.0
20	2081.6	1230.2	20	2265.3	1392.7	20	2476.2	1582.6
30	2088.8	1236.5	30	2273.5	1400.0	30	2485.7	1591.2
40	2096.0	1242.9	40	2281.7	1407.4	40	2495.3	1599.9
50	2103.2	1249.2	50	2290.0	1414.8	50	2504.9	1603.6
123	2110.5	1255.6	127	2298.4	1422.3	131	2514.5	1617.4
10	2117.9	1262.1	10	2306.8	1429.8	10	2524.2	1626.2
20	2125.3	1268.6	20	2315.2	1437.4	20	2534.0	1635.2
30	2132.7	1275.1	30	2323.7	1445.0	30	2543.9	1644.1
40	2140.1	1281.7	40	2332.3	1452.7	40	2553.8	1653.2
50	2147.6	1288.3	50	2340.9	1460.4	50	2563.8	1662.3
124	2155.2	1295.0	128	2349.5	1468.1	132	2573.8	1671.5
10	2162.8	1301.7	10	2358.2	1476.0	10	2583.9	1680.7
20	2170.4	1308.4	20	2367.0	1483.8	20	2594.1	1690.0
30	2178.1	1315.2	30	2375.8	1491.8	30	2604.3	1699.4
40	2185.8	1322.0	40	2384.6	1499.7	40	2614.6	1708.8
50	2193.5	1328.9	50	2393.5	1507.8	50	2625.0	1718.3

Correcciones para las Tangentes, añada

Angulo	3° Cur.	5° Cur.	7° Cur.	9° Cur.	11° Cur.	12° Cur.	14° Cur.	16° Cur.	18° Cur.	20° Cur.	22° Cur.	24° Cur.
10°	.00	.01	.01	.01	.01	.00	.00	.00	.01	.01	.01	.01
20°	.01	.01	.02	.02	.03	.01	.01	.01	.01	.01	.01	.02
30°	.01	.02	.03	.03	.04	.01	.01	.02	.02	.02	.02	.02
40°	.01	.03	.04	.05	.06	.02	.02	.02	.02	.03	.03	.03
50°	.02	.03	.05	.06	.07	.02	.02	.03	.03	.03	.04	.04
60°	.02	.04	.06	.08	.09	.02	.03	.03	.04	.05	.05	.06
70°	.03	.05	.07	.09	.11	.03	.03	.04	.05	.05	.06	.06
80°	.03	.06	.08	.11	.13	.04	.04	.05	.05	.06	.07	.07
90°	.04	.07	.10	.13	.16	.04	.05	.06	.06	.07	.08	.09
100°	.05	.09	.12	.15	.19	.05	.06	.07	.08	.09	.10	.10
110°	.06	.10	.14	.19	.23	.06	.07	.08	.09	.10	.11	.12
120°	.07	.12	.17	.23	.28	.07	.09	.10	.11	.12	.14	.15
130°	.08	.15	.21	.28	.34	.09	.11	.12	.14	.15	.17	.19

Correcciones para Externas. Añada

Angulo	3° Cur.	5° Cur.	7° Cur.	9° Cur.	11° Cur.	12° Cur.	14° Cur.	16° Cur.	18° Cur.	20° Cur.	22° Cur.	24° Cur.
20°	.001	.001	.002	.002	.002	.001	.001	.001	.001	.001	.001	.001
30°	.001	.002	.004	.005	.006	.001	.002	.002	.002	.003	.003	.003
40°	.002	.004	.006	.008	.010	.003	.003	.004	.004	.005	.005	.006
50°	.004	.007	.010	.013	.016	.001	.005	.006	.007	.007	.008	.009
60°	.006	.011	.015	.020	.025	.006	.008	.009	.010	.011	.012	.013
70°	.01	.02	.02	.03	.04	.01	.01	.01	.01	.02	.02	.02
80°	.01	.02	.03	.04	.05	.01	.02	.02	.02	.02	.02	.03
90°	.02	.03	.04	.05	.07	.02	.02	.02	.03	.03	.03	.04
100°	.02	.04	.06	.07	.09	.02	.03	.03	.04	.04	.04	.05
110°	.03	.05	.07	.10	.12	.03	.04	.04	.05	.05	.06	.07
120°	.04	.07	.10	.13	.16	.04	.05	.06	.06	.07	.08	.09
130°	.05	.10	.14	.18	.22	.06	.07	.08	.09	.10	.11	.12

TABLA IV Cuerdas a un radio 1, para trazo de ángulos

Angulo	0'	10'	20'	30'	40'	50'	DIFERENCIAS				
							2'	4'	6'	8'	10'
0°	.0000	.0029	.0058	.0087	.0116	.0145	6	12	17	23	29
1°	.0175	.0204	.0233	.0262	.0291	.0320					
2°	.0349	.0378	.0407	.0436	.0465	.0494					
3°	.0524	.0553	.0582	.0611	.0640	.0669					
4°	.0698	.0727	.0756	.0785	.0814	.0843					
5°	.0872	.0901	.0931	.0960	.0989	.1018					
6°	.1047	.1076	.1105	.1134	.1163	.1192					
7°	.1221	.1250	.1279	.1308	.1337	.1366					
8°	.1395	.1424	.1453	.1482	.1511	.1540					
9°	.1569	.1598	.1627	.1656	.1685	.1714					
10°	.1743	.1772	.1801	.1830	.1859	.1888					
11°	.1917	.1946	.1975	.2004	.2033	.2062					
12°	.2091	.2119	.2148	.2177	.2206	.2235					
13°	.2264	.2293	.2322	.2351	.2380	.2409					
14°	.2437	.2466	.2495	.2524	.2553	.2582					
15°	.2611	.2639	.2668	.2697	.2726	.2755					
16°	.2783	.2812	.2841	.2870	.2899	.2927					
17°	.2956	.2985	.3014	.3042	.3071	.3100					
18°	.3129	.3157	.3186	.3215	.3244	.3272	6	11	17	23	29
19°	.3301	.3330	.3358	.3387	.3416	.3444					
20°	.3473	.3502	.3530	.3559	.3587	.3616					
21°	.3645	.3673	.3702	.3730	.3759	.3788					
22°	.3816	.3845	.3873	.3902	.3930	.3959					
23°	.3987	.4016	.4044	.4073	.4101	.4130	6	11	17	23	28
24°	.4158	.4187	.4215	.4244	.4272	.4300					
25°	.4329	.4357	.4386	.4414	.4442	.4471					
26°	.4499	.4527	.4556	.4584	.4612	.4641					
27°	.4669	.4697	.4725	.4754	.4782	.4810					
28°	.4838	.4867	.4895	.4923	.4951	.4979					
29°	.5008	.5036	.5064	.5092	.5120	.5148					
30°	.5176	.5204	.5233	.5261	.5289	.5317	6	11	17	22	28
31°	.5345	.5373	.5401	.5429	.5457	.5485					
32°	.5513	.5541	.5569	.5597	.5625	.5652					
33°	.5680	.5708	.5736	.5764	.5792	.5820					
34°	.5847	.5875	.5903	.5931	.5959	.5986					
35°	.6014	.6042	.6070	.6097	.6125	.6153					
36°	.6180	.6208	.6236	.6263	.6291	.6319					
37°	.6346	.6374	.6401	.6429	.6456	.6484					
38°	.6511	.6539	.6566	.6594	.6621	.6649	5	11	16	22	27
39°	.6676	.6704	.6731	.6758	.6786	.6813					
40°	.6840	.6868	.6895	.6922	.6950	.6977					
41°	.7004	.7031	.7059	.7086	.7113	.7140					
42°	.7167	.7195	.7222	.7249	.7276	.7303					
43°	.7330	.7357	.7384	.7411	.7438	.7465					
44°	.7492	.7519	.7546	.7573	.7600	.7627					

Las diferencias estan en diez milésimos del Radio

TABLA IV Cuerdas a un radio 1, para trazo de ángulos

Angulo	0'	10'	20'	30'	40'	50'	DIFERENCIAS				
							2'	4'	6'	8'	10'
45°	.7654	.7681	.7707	.7734	.7761	.7788	5	11	16	21	27
46°	.7815	.7841	.7868	.7895	.7922	.7948					
47°	.7975	.8002	.8028	.8055	.8082	.8108					
48°	.8135	.8161	.8188	.8214	.8241	.8267					
49°	.8294	.8320	.8347	.8373	.8400	.8426	5	11	16	21	26
50°	.8452	.8479	.8505	.8531	.8558	.8584					
51°	.8610	.8636	.8663	.8689	.8715	.8741	5	10	16	21	26
52°	.8767	.8794	.8820	.8846	.8872	.8898					
53°	.8924	.8950	.8976	.9002	.9028	.9054					
54°	.9080	.9106	.9132	.9157	.9183	.9209					
55°	.9235	.9261	.9287	.9312	.9338	.9364	5	10	15	21	26
56°	.9389	.9415	.9441	.9466	.9492	.9518					
57°	.9543	.9569	.9594	.9620	.9645	.9671	5	10	15	20	26
58°	.9696	.9722	.9747	.9772	.9798	.9823	5	10	15	20	25
59°	.9848	.9874	.9899	.9924	.9950	.9975					
60°	1.0000	1.0025	1.0050	1.0075	1.0101	1.0126					
61°	1.0151	1.0176	1.0201	1.0226	1.0251	1.0276					
62°	1.0301	1.0326	1.0351	1.0375	1.0400	1.0425					
63°	1.0450	1.0475	1.0500	1.0524	1.0549	1.0574					
64°	1.0598	1.0623	1.0648	1.0672	1.0697	1.0721					
65°	1.0746	1.0771	1.0795	1.0819	1.0844	1.0868	5	10	15	20	24
66°	1.0893	1.0917	1.0942	1.0966	1.0990	1.1014	5	10	15	19	24
67°	1.1039	1.1063	1.1087	1.1111	1.1136	1.1166					
68°	1.1184	1.1208	1.1232	1.1256	1.1280	1.1304	5	10	14	19	24
69°	1.1328	1.1352	1.1376	1.1400	1.1424	1.1448					
70°	1.1472	1.1495	1.1519	1.1543	1.1567	1.1590					
71°	1.1614	1.1638	1.1661	1.1685	1.1709	1.1732	5	9	14	19	24
72°	1.1756	1.1779	1.1803	1.1826	1.1850	1.1873	5	9	14	19	23
73°	1.1896	1.1920	1.1943	1.1966	1.1990	1.2013					
74°	1.2036	1.2060	1.2083	1.2106	1.2129	1.2152					
75°	1.2175	1.2198	1.2221	1.2244	1.2267	1.2290	5	9	14	18	23
76°	1.2313	1.2336	1.2359	1.2382	1.2405	1.2428					
77°	1.2450	1.2473	1.2496	1.2518	1.2541	1.2564					
78°	1.2586	1.2609	1.2632	1.2654	1.2677	1.2699					
79°	1.2722	1.2744	1.2766	1.2789	1.2811	1.2833	4	9	13	18	22
80°	1.2856	1.2878	1.2900	1.2922	1.2945	1.2967					
81°	1.2989	1.3011	1.3033	1.3055	1.3077	1.3099					
82°	1.3121	1.3143	1.3165	1.3187	1.3209	1.3231	4	9	13	17	22
83°	1.3252	1.3274	1.3296	1.3318	1.3339	1.3361					
84°	1.3383	1.3404	1.3426	1.3447	1.3469	1.3490					
85°	1.3512	1.3533	1.3555	1.3576	1.3597	1.3619	4	9	13	17	21
86°	1.3640	1.3661	1.3682	1.3704	1.3725	1.3746	4	8	13	17	21
87°	1.3767	1.3788	1.3809	1.3830	1.3851	1.3872					
88°	1.3893	1.3914	1.3935	1.3956	1.3977	1.3997					
89°	1.4018	1.4039	1.4060	1.4080	1.4101	1.4122	4	8	12	17	21

Las diferencias están en diez milésimos del Radio





